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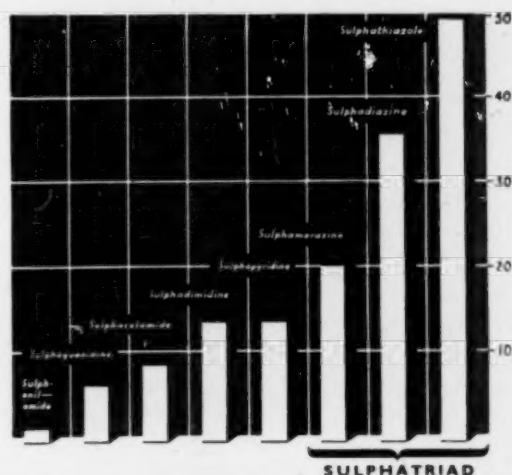
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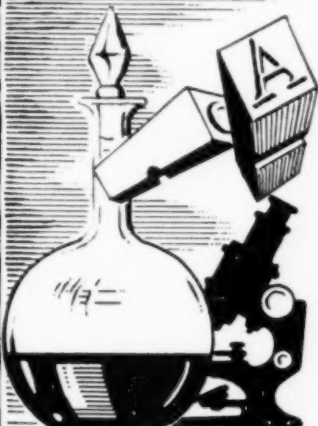
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PAGET'S DISEASE OF THE VULVA

A CASE REPORT

A. C. NAYLOR, M.D., M.R.C.O.G.*

Johannesburg

The following case of Paget's disease of the vulva, histologically proved, is reported because of its apparent rarity.

Caspar,¹ in an exhaustive review in 1948, could only find 33 published cases of extra-mammary Paget's disease, of which 14 were in the genitalia, and of these 14 only in 8 could it be accepted that the site was the vulva. He reported what he considered to be the 9th case. Case reports since then have been difficult to find. Nelson² reported a case in the right intergluteal region.

CASE REPORT

28 January 1953. Spinster (European) aged 66. Main complaint of pruritus vulvae of just over 2 years duration. During the last 3 months a rough reddened area had developed on the right of the vulva, with a marked increase in symptoms.

Previous History. In 1951, after examination under anaesthesia and curettage had revealed no lesion, a course of X-ray therapy was ordered for the pruritus. After 2 treatments the patient developed an extensive thrombophlebitis of the right leg and no further treatment was given. Relief was evanescent.

A mild attack of infective hepatitis in 1952, caused no noticeable change.

Apart from this the patient had always been fit and well.

Examination. General examination was essentially negative. Blood pressure 128/84. Urine—no albumin, no sugar.

Vulva. The whole vulva was scratched, reddened and scabby. On the right side of the perineum, encroaching on the fourchette was a raised abraded area about 2½ inches in diameter. The surface was not ulcerated, but had been scratched until it bled. This had appeared over the last 3 months.

Vaginal examination was not possible.

There were doubtful glands palpable in the right inguinal region.

Treatment. Acid hydrochlor. dil. was prescribed together with a soothing lotion, and after 5 days the signs of scratching had disappeared.

A number of small whitish soft areas were now apparent.

The rough reddened area was thickened, raised and indurated, with a serpiginous margin. Another pea-size

area of the same appearance was noted on the outer border of the right labium majus.

6 February 1953. Pelvic examination under anaesthesia revealed no disorder other than a minor degree of senile vaginitis. A cervical biopsy showed signs of a mild chronic inflammation. No rectal disorder was detected. Biopsy specimens were taken from 2 places in the raised reddened area. Inguinal glands were no longer palpable.

Biopsy Report. (Dr. K. G. Irving, Johannesburg). 'Sections of the specimen taken from the vulva show the presence of hyperplastic stratified squamous epithelium, which is in places arranged in a papillomatous manner with, in addition, marked downward prolongation of the rete pegs.

Many of the epithelial cells are large and vacuolated and closely resemble Paget cells. Some of the epithelial cells have hyperchromatic nuclei and there is evidence of mitotic activity.

The histological features are consistent with those of an extra-mammary Paget's disease, and should be regarded and treated as those of carcinoma. No primary cause for the carcinomatous change in the epithelium has been observed in the adnexal structures examined in these sections'.

This opinion was confirmed by Dr. J. N. Murray of the South African Institute for Medical Research.

Operation. Vulvectomy was considered to be the treatment of choice under the circumstances.

X-rays of the chest, full blood count and blood urea were normal.

16 February 1953. Under gas, oxygen and other anaesthesia the operation was proceeded with after the manner described by Way.³

Enlarged glands were encountered on both sides. Retroperitoneal dissection of the lymph glands was therefore carried out bilaterally to include the common iliac group of glands. These were removed *en masse* together with a block dissection of all the inguinal groups.

The area of skin removal was wide, particularly on the right, where it extended to the skin overlying the ischial tuberosity. Some anal skin was also removed to insure adequate excision, and the area here was covered by a sliding flap brought down from the vagina.

The wound was closed as far as possible, but a large raw area remained that was packed with vaseline gauze and firmly bandaged.

An indwelling catheter was inserted.

* Recently Lecturer in Gynaecology and Obstetrics, University of the Witwatersrand.

Section of the lymph glands showed no sign of malignant neoplasia.

Early rising was encouraged. Oedema of the right leg was troublesome because of a moderate degree of thrombophlebitis.

To speed healing, as the patient wished to proceed overseas, a split-thickness skin graft was done on 9 March. The take was fairly good, but subsequent scarring was stiff and tender.

The patient was discharged fit and well 6 weeks after the original operation, and at the time of writing is well with practically no disability.

DISCUSSION

Apart from its rarity, the interest in the case lies in the diagnosis and treatment.

The clinical picture tallies very closely to that given by Hunt⁴ as typical of the condition.

The histological features of the lesion under discussion are well brought out in the report on the histological sections (Figs. 1 and 2). One can entertain a clinical suspicion but a definite diagnosis can only be made after biopsy.

Lewis⁵ contends that the so-called Paget cells are not necessarily specific for Paget's disease. He supports the idea of a true and false Paget's disease, the histological features being the same.

Anderson⁶ questions whether Paget's cells represent an epidermal carcinoma—whether an intra-epidermal metastasis—or are just peculiar cells.

Caspar¹ considers any statement as to the histogenesis of Paget cells to be pure speculation, but has no doubt that a true extra-mammary Paget's disease does occur. His review is exhaustive, and seems to agree with the modern trend of view that the disease can occur without any underlying carcinoma.

Ideas on treatment are equally diverse.

Ewing⁷ gave X-ray therapy as he considered the con-

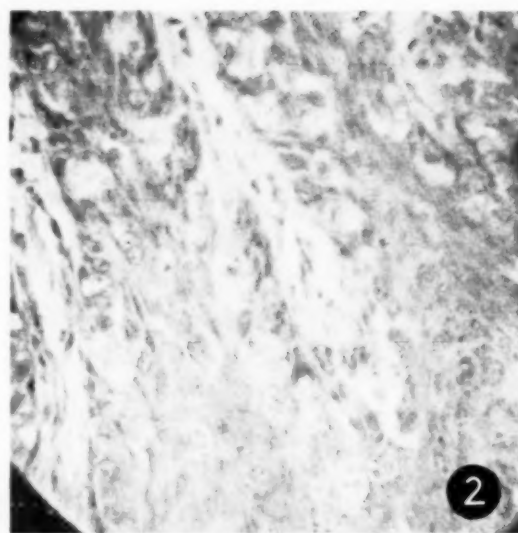


Fig. 2. High power (same field). Showing the enlarged vacuolated Paget cells. Mitotic figures can be seen in some of them.

dition to be an indolent carcinoma. Weiner⁸ was more radical as he considered that there was always an underlying carcinoma.

Simple excision of the vulva was advocated by Hunt.⁴ Lewis⁵ states that 'since Paget's disease of the penis, as in any other location, is precancerous, it should be treated as carcinoma'.

Nelson² advocates radical excision, and Caspar¹ mentions a case that recurred after local excision and needed more radical procedure. His own case was treated by X-rays, but he soon had cause to recommend vulvectomy.

To-day a radical vulvectomy with extensive gland dissection is considered to be the best treatment for carcinoma of the vulva. The consensus of opinion seems to be that Paget's disease is either a true carcinoma or a direct extension to the skin from an underlying lesion. In either case a radical vulvectomy is the treatment of choice.

SUMMARY

A case of Paget's disease of the vulva is presented. Treatment was by means of a radical vulvectomy and extensive gland dissection.

My thanks are due to Dr. A. D. Bensusan, who referred the case to me, to Dr. J. F. C. Grant for his able assistance, and to Mr. W. Girdwood for doing the skin graft.

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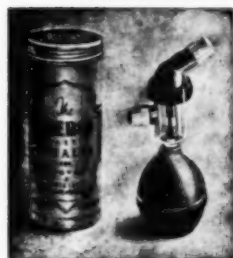
Fig. 1. Low Power. Showing the downward prolongation of the rete pegs and the Paget's cells.

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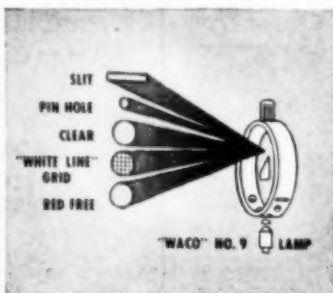
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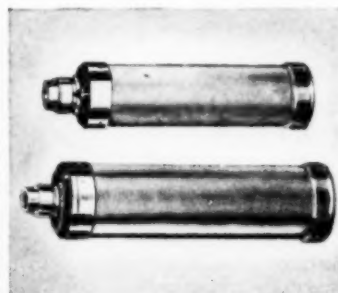
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VAN DIE REDAKSIE

VALVOTOMIE VIR MYTERSTENOSE

Mytervernouing is die mees algemene letsel aan die hartkleppe wat deur rumatiekkoors veroorsaak word en die groot belangstelling in Suid-Afrika vir die snykundige behandeling daarvoor word getoon in die artikels wat in hierdie en onlangse uitgawes van die *Tydskrif* verskyn het.

Tot 1948 was mytervalvotomie nie 'n praktiese operasie nie, maar die afgelope 5 jaar het voldoende bewys gelever beide van 'n lae sterftesyfer en die groot voordele verbonde aan die snykundige verligting van hierdie intrakardiale verstopping. Sonder behandeling sterf 95% van pasiënte met mytervernouing aan hul kwaal; met valvotomie kan 75% 'n normale lewe hervat. Vandag is die moeilike taak nie om te besluit of enige besondere geval vir valvotomie geskik is nie, maar of 'n pasiënt nie 'n geskikte geval vir die operasie is nie.

Dat snykundige behandeling vir stenose enigszins moontlik is, is te danke aan die feit dat die vasklewende rante van die kleplippe geskei kan word en 'n normaal-funktionerende myteropening weer gevorm kan word. Die groot diagnostiese probleme is om te besluit of daar werklik 'n vernouing is en of terugvloeiing, wat daarmee gepaard gaan, hoofsaaklik vir die ongeskiktheid verantwoordelik is en of belangrike hartspierbeskadiging bestaan. Hierdie probleme val hoofsaaklik binne die gebied van die hartspesialis, maar dit is aan die medewerking van snydokters te danke dat die belangrikheid van hierdie probleme aan die lig gebring is.

Hierdie uitgawe van die *Tydskrif* is hoofsaaklik aan die snykundige aspekte van stenose gewy. Drs. Adler en Fuller gee 'n oorsig van die kliniese kenmerke en resultate van hul eerste 50 valvotomie-gevalle en dr. Phillips en dr. Barnat behandel ander aspekte van dieselfde onderwerp. Elke artikel is leersaam en treffend en dit sou dwaas wees om hul gesamentlike redenasies ten gunste van die operasie te veronagsaam.

Na die operasie tree daar in die meeste gevalle merkwaardige simptomatiese verligting en funksionele verbetering in, en hartlyers kan tot 'n nuttiger lewe terugkeer. Die meeste hartlyers is in die fleur van hul lewe en hul ongeskiktheid kan hul diep ongelukkig maak. Sielkundige verstorings is taamlik algemeen. Dit is te verstaan dat die vooruitsig van verligting verwelkom word, en die operasie word as 'n goeie kans en nie as 'n wanhopige waagstuk aanvaar nie. Sterfgevalle, laer as 5% onder gemiddelde gevalle, en die resultate, bekrachtig die redelikeheid van hierdie sienswyse.

In 'n onlangse uitgawe van hierdie *Tydskrif* het dr. Graham¹ die keuse van gevalle wat vir valvotomie geskik is bespreek en die menings wat oor hierdie punt in hierdie uitgawe gelug word toon 'n merkwaardige eensgesindheid

EDITORIAL

VALVOTOMY FOR MITRAL STENOSIS

Mitral stenosis is the most common valvular lesion caused by rheumatic disease and in this country the great interest in its surgical correction is shown by the articles published in this and recent issues of the *Journal*.

Until 1948 mitral valvotomy was not a practical procedure, but the last 5 years have amply demonstrated both the low mortality and the great benefits of surgical relief of this intracardiac obstruction. Untreated 95% of patients with mitral stenosis die from their disease; after valvotomy 75% return to a normal life. The problem today is not whether valvotomy should be done in the ordinary case but of deciding which patients should not be operated on.

That operative correction of stenosis is at all possible depends on the fact that the adherent edges of the valve-cusps can be separated and a functionally-normal mitral orifice reconstituted. In diagnosis the chief problems are to decide whether stenosis is really present, whether any accompanying regurgitation is mainly responsible for the disability, and whether there is significant myocardial damage. These problems fall chiefly within the province of the cardiologist, but surgeons were instrumental in revealing their importance.

This issue of the *Journal* is mainly devoted to articles on the surgical aspects of stenosis. Messrs. Adler and Fuller review the clinical features and results of the first 50 cases they submitted to valvotomy. Mr. Phillips and Mr. Barnat present different facets of the same subject. Each article is instructive and impressive; taken together they present an argument for operation that it would be foolish to ignore.

In the majority of cases symptomatic relief and functional improvement after operation are remarkable and cardiac invalids are returned to a more useful life. Most are in the prime of life and their disability is a source of profound distress. Psychological disturbances are not uncommon. Understandably, the prospect of relief is welcomed and operation is accepted as a good chance and not as a desperate risk. Mortality, less than 5% in average cases, and results, confirm the reasonableness of this view.

In a recent issue of this *Journal*, Mr. Graham¹ discussed the selection of cases for valvotomy, and the opinions expressed in this number show the remarkable unanimity of views amongst cardiac surgeons on this

1. Graham, A. J. P. (1953): S.A. Tydskrif vir Geneeskunde, 27, 1073 (November 28).

1. Graham, A. J. P. (1953): S. Afr. Med. J., 27, 1073 (28 November).

onder hartspecialiste. Kortom gestel, behoort valvotomie in aanmerking geneem te word vir alle pasiënte tussen die ouderdomme van 20 en 45 jaar wat aan stenose ly. Uitsonderings op hierdie veralgemening is pasiënte met aktiewe of latente hartontsteking, of gevalle waar myterterugvloeiing en hartklepsiekte 'n oorheersende rol speel en diegene met swak harte wat nie op mediese behandeling reageer nie. Dit is moeilik om hartontsteking en 'n oorheersende terugvloeiing te diagnoseer in pasiënte wat aan stenose ly. Drs. Adler en Fuller bespreek hul kriteria vir die vasstelling van hartontsteking. Ondervindings het aan die lig gebring dat in hierdie kondisie daar ná die operasie 'n neiging is tot hernude uitbrekings van rumatiekheartontsteking en die operasie moet vermy word behalwe in noodgevalle soos ernstige bloedsuigwing of herhaaldelike ernstige edeem van die long. Die belangrikheid van hartvergroting is oorbeklemtoon. Van belang is die vergroting van die linkerhartkamer wat in verband staan met terugvloeiing van hartklepsiekte. Nietemin is bevredigende resultate verkry in gevalle met beide aortaklep- en myterstenose deur beide aortaklep- en mytervalvotomie uit te voer.

Ons skrywers wys daarop dat valvotomie van groot betekenis is vir swanger vrouens wat aan mytervernouing ly. Hierdie pasiënte staan die operasies net so goed as ander pasiënte en daar bestaan nou min regverdiging vir die beëindiging van die swangerskap op grond van hierdie kondisie.

Oor die algemeen bied narkose vir valvotomie geen noemenswaardige probleem aan nie. Die hoofvereistes is die vroegtydige toediening van 'n kalmeermiddel om emosionele steurings te beheer wat moontlik longedeem kan veroorsaak en om vir volle suurstoftoediening gedurende die operasie te sorg.

Mytervalvotomie is een van die groot mylpale in die vooruitgang van geneeskunde gedurende die afgelope 10 jaar. Ander mylpale sal seker nog volg en metodes waardeur intrakardiale prosedures deur besigtiging met die blote oog onderneem kan word sal waarskynlik hierdie gebied van snykunde bo hedendaagse verwagtings uitbrei.

point. Briefly, valvotomy should be considered for all patients aged between 20 and 45 years suffering from disability due to stenosis. Exceptions to this generalization are those with active or latent carditis, those in whom mitral regurgitation or aortic valve disease are predominant, and those with cardiac failure which does not respond to medical treatment. Of these, carditis and predominant regurgitation are difficult to diagnose in patients with stenosis. Messrs. Adler and Fuller discuss their criteria for assessing carditis. Experience has shown that in this condition recrudescence of rheumatic carditis is liable to follow operation, which should be avoided except for emergencies such as severe haemoptysis or recurrent severe pulmonary oedema. The importance of cardiac enlargement has been overstressed. The important feature is enlargement of the left ventricle which is associated with regurgitation or aortic valve disease. However, in cases where both aortic and mitral stenosis are present, the procedure of aortic valvotomy together with mitral valvotomy is giving promising results.

Our authors point out the change that valvotomy has produced in the outlook for pregnant women suffering disability from mitral stenosis. These patients stand operation as well as others and there is now little justification for termination of pregnancy for this condition.

In the average case, anaesthesia for valvotomy does not present any great problem. Sedation well beforehand to control emotional disturbances liable to give rise to pulmonary oedema, and full oxygenation during the operation are the main essentials.

Viewed over-all mitral valvotomy has been one of the great advances in medicine in the last 10 years. Others are following, and methods permitting intracardiac procedures under direct vision are likely to expand this field of surgery beyond present conceptions.

MITRAL STENOSIS

A REVIEW OF 50 CASES SUBJECTED TO OPERATION

DAVID ADLER, F.R.C.S. (EDIN.) AND DENIS FULLER, F.R.C.S. (ENG.)

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As long ago as 1902 Sir Lauder Brunton,¹ a physician, suggested that valvular disease of the heart should be corrected by operative methods. In 1913 Doyen² performed the first intra-cardiac operation on man, failing to cure a valvular pulmonic stenosis. By digitally dilating a stenotic aortic valve Tuffier³ in 1914 performed the first operation for rheumatic valvular disease of the heart. The first attempts at operating upon the stenotic mitral valve were those of Cutler⁴ and his associates, who between 1923 and 1928 operated upon 7 such patients. In 1923 Allen and Graham⁵ attempted to relieve a stenosis by operating through a cardioscope. In 1925 Souttar⁶ reported the first successful case of digital dilatation of

the mitral valve. By 1928 12 patients with mitral stenosis had been operated upon, with 9 deaths. The 3 that survived were all improved, two following finger dilatation. The others died after division of the valves by blind tenotomy or by knife guided by a cardioscope, or after blind partial excision of the valve.

There followed a lull of 18 years until 1945, when Bailey⁷ first performed his operation dividing the commissures by valvulotomy knife guided by finger control in the left auricle. In 1948 Dwight Harken⁸ and his associates operated upon several patients by 'biting out' portions of the valve cusps. None of these patients were improved as frank mitral regurgitation ensued. Smithy⁹ also was

advocating in 1947 and reporting in 1950 the surgical excision by punch forceps of portions of the valve cusps, i.e. valvulotomy. His first case was operated upon in January 1948 but after preliminary improvement died from congestive cardiac failure attributed to mitral regurgitation. In 5 of his 8 operations he went through the wall of the left ventricle and in only 3 via the left auricle. He reported after 8 months that the 5 survivors were markedly improved. Smithy's interest in rheumatic valvular disease was personal, and he died shortly afterwards from the affliction he had tried so much to help in others.

In 1948 R. C. Brock,¹⁰ who had already performed a number of successful intra-cardiac operations for the relief of valvular pulmonic stenosis, performed his first operation for the relief of mitral stenosis by finger fracture or dilation valvotomy. We attempt to follow his teaching.

Though persons with mitral stenosis may remain without symptoms throughout a normal life span, once symptoms commence the downward trend towards increasing incapacity is inevitable. The urgent desire on the part of the patients to be relieved of the unbearable burden of their symptoms is an index of the physical futility of their lives. Equally striking is the dramatic improvement following successful valvotomy.

The picture of a young woman attending her doctor or the outpatient department of a hospital month after month in the hope of obtaining some permanent relief from the incapacity which her breathlessness on exertion engenders, the recurring episodes of haemoptysis and pulmonary oedema, the praecordial pain, and the frustration of sexual life, is such that it is strange that until recent years efforts were not directed towards the relief of the mechanical stenosis which is the basis of these difficulties.

SYMPTOMS AND THE MECHANISM OF THEIR PRODUCTION

It is now fairly clear what physiological and pathological changes take place as a result of progressive narrowing of the mitral ring. First there is a rise in left auricular pressure from its normal value of 5-7 mm. of mercury, which is transmitted backwards to the pulmonary veins and capillaries and the right heart. At first the increased left auricular pressure allows flow through the narrowed valve to be maintained at a normal level except with severe demands such as strenuous exercise. The increased pulmonary venous and capillary pressures, however, and the resultant engorgement of these vessels, result in breathlessness, at first on effort only, and orthopnoea, which are the chief cause of disability in the mitral stenotic. In addition these thin-walled vessels are liable to rupture and cause haemoptyses. Were it not for a second mechanism which comes into play the pulmonary capillary pressure would progressively rise as the lesion became more serious, and when it exceeded the osmotic pressure of plasma (30-35 mm. Hg) transudation of plasma and pulmonary oedema would occur.

In fact, of course, this is a rare occurrence, and when it occurs it is the result of acute circulatory loads caused by excessive effort, emotion, etc., or less acute ones caused by pregnancy, intercurrent illness, etc. In fact as the pulmonary capillary pressure rises a progressive pulmonary arteriolar constriction takes place which, teleologically speaking, protects the pulmonary capillary bed from excessive pressures. This increase in arteriolar resistance is the major cause of the very marked rise of pressure in the pulmonary artery which takes place and eventually causes right ventricular hypertrophy, with eventual dilatation, failure and tricuspid incompetence.

Symptoms may therefore be divided into two groups: those resulting from pulmonary venous and capillary hypertension (dyspnoea, orthopnoea, haemoptysis, and pulmonary oedema) and those due to pulmonary artery hypertension

(enlargement of the pulmonary artery, loud pulmonary second sound, pulmonary valve incompetence, and right ventricular hypertrophy; and failure with resultant raised venous pressure, hepatomegaly, oedema and tricuspid regurgitation).

Depending on the efficiency and degree of this pulmonary vaso-constriction, cases may present with symptoms predominantly of one group or the other. Typically in the early case dyspnoea and haemoptysis are the major feature, and with progression the features of right heart failure become superadded. When pulmonary vaso-constriction is marked, however, the subject may be protected from severe breathlessness and haemoptysis throughout and will have no severe disability until systemic congestive symptoms occur.

It should be observed here that while an adequate split of the mitral valve should always relieve the subject of pulmonary venous congestion and its symptoms, the pulmonary hypertension when of long standing results in pulmonary sclerotic changes which are either irreversible or only very slowly reversible. Consequently a less happy result is to be expected in those subjects in whom right heart failure has been marked and of long standing.

1. *Dyspnoea* is usually the earliest symptom. The severity varies from patient to patient and in the same patient from time to time. In some patients, especially the young, it is trivial and made light of; in others it is so severe that they are virtually bedridden and afraid to exert themselves in the slightest. Most cases have some degree of orthopnoea—and many nocturnal breathlessness, usually due to slipping down during sleep. Some experience paroxysmal dyspnoea. Severe dyspnoea on sexual intercourse is a very common symptom of mitral stenosis, often with resultant unhappiness in marriage.

2. *Cough* is a very common complaint in healthy individuals and its significance is difficult to assess. In many of our patients a dry cough was frequently related to the onset of other stenotic symptoms and was relieved by valvotomy. Recurrent bouts of so-called bronchitis, especially when associated with haemoptysis and unaccompanied by fever, are highly suggestive of pulmonary congestion. These attacks do not respond to antibiotics, but to adequate treatment of the underlying cardiac condition. In 3 of our cases there was suppurative bronchiectasis of the left lower lobe, and in them relief of cough after operation has been less evident.

Severe pulmonary oedema has not been common (12 cases in our series). When this does occur there is a sudden onset of intense dyspnoea with the production of large amounts of frothy, often bloodstained, sputum. It is precipitated by emotion and anxious patients awaiting operation are best sedated to prevent such a catastrophe.

3. *Haemoptysis* is a frightening spectacle to the patient. In our series 31 have had haemoptysis, which has varied in severity and frequency. In some, blood-staining occurs frequently with each episode of bronchitis, in others it is associated with pain and collapse caused by an infarct. In several it was the only major symptom. Two cases each coughed up 2 pints of blood, followed by daily blood-streaking for 2 months. The occurrence of haemoptysis then indicates either a severe degree of pulmonary venous congestion or emboli. It is always a cogent reason for seeking advice and for considering operation. Haemoptysis is rarely single, and the patient's anxiety whilst waiting for the next incident calls for relief.

4. *Emboli* can be either systemic or pulmonary. Systemic emboli, except in the case of paradoxical emboli passing through a patent foramen ovale, are always derived from the left side of the heart, usually the left auricular appendage, less commonly the wall of the auricle itself, and rarely the verrucose or calcified valve cusps. Emboli most commonly pass to the brain (2 cases), with no particular predilection for either side, sometimes to the peripheral limb vessels (2), and rarely to the spleen (2).

Pulmonary emboli occurred pre-operatively in 12 cases. These are more common pre-operatively and are derived from the leg veins, which, because of sluggishness in the circulation, and associated with prolonged periods of bed rest, are often the site of thrombus formation. Many an ill patient waiting for surgery under ideal circumstances of hospitalization has been stricken with near-fatal pulmonary

embolus. In other cases the source of the pulmonary embolus is in the turgid right auricle.

5. *Congestive Cardiac Failure* occurred in 24 cases. In many it is transient and responds readily to bed rest and adequate medical treatment. In others it is difficult to control, but it must be overcome before the patient is subjected to valvotomy.

6. *Pain* is probably the most difficult symptom to assess. In many analysis confirms the impression that it is of psychical origin. In such cases it is felt over the praecordium, under the left breast, and is not referred to the neck, shoulder or arm. It is usually described as aching or stabbing, inconstant, and lasting from a few minutes to a few hours. It occurs with equal frequency at rest and on exercise and is not relieved by nitrites. Reassurance that the pain is not due to heart disease is particularly important. The post-operative discomfort in the incision should also be explained, or the patient will feel that the heart lesion has not been alleviated. A history of low sternal or epigastric pain associated with eructation of acids and wind is in some cases highly suggestive of hiatus hernia, but in 4 of our cases, in which it has been investigated radiologically, no evidence of hiatus hernia or gastro-oesophageal regurgitation has been found. A sensation of retro-sternal discomfort or of oppression is often experienced with dyspnoea, but the pain is not of anginal character. Perhaps some of these pains are due to distension of the liver.

We have had 5 cases in which pain has been of anginal type and in 1 coronary thrombosis was diagnosed on clinical grounds. It is probably due to the fall in cardiac output which takes place in mitral stenosis with exercise, and the consequent fall in coronary artery circulation.

7. *Fainting* has occurred in 12 of our patients. As an isolated symptom it is never an indication for operation. In several, anxiety might well have been responsible; in others the desire to attract more attention. In some, the inability to increase the cardiac output on exertion causes temporary cerebral ischaemia, as in the attacks occurring in patent ductus arteriosus due to the low diastolic pressure. In other cases sudden alteration in the rate or rhythm of the heartbeat is responsible.

SELECTION OF CASES FOR OPERATION

1. Cases which are liable to develop further stenosis should not be subjected to operation; i.e. there must be no evidence of active rheumatic infection.

2. In the case for operation the cardinal symptoms must be related to the stenosis of the mitral valve, and other valvular lesions present must be either remediable or dynamically not significant. Functional lesions, e.g. tricuspid incompetence, are reversible after valvotomy.

3. In the case for operation the element of stenosis must predominate over that of incompetence.

4. Calcification in the valves renders operation more difficult. The results in such cases also tend to be less satisfactory, as the split valves do not function as satisfactorily as those that are more pliable.

5. The secondary changes from long-standing obstruction influence the result of operation, viz: (a) pulmonary hypertension, (b) auricular fibrillation, and (c) myocardial damage.

Contra-indications to Operation

A. Temporary Contra-indications

(1) *Rheumatic activity.* The presence of rheumatic activity or recent activity precludes operation. Under such circumstances operation is unquestionably more dangerous and there is the possibility that the commissures, even if split adequately, will fuse again. Assessment of activity on clinical grounds is difficult, but a history of unexplained fever, sweats, joint or muscle pains, pallor, lassitude or general deterioration in health are suggestive. To sub-

stantiate these clinical suspicions we use the sedimentation rate, the plasma viscosity, blood muco-proteins, and more recently the 'C' reactive protein.

(2) *Uncontrolled or progressive congestive cardiac failure.* Every effort should be made by medical treatment to improve such cases before valvotomy. Acute pulmonary oedema may on the other hand be an absolute indication for early or even emergency surgery.

(3) *Recent embolism.* In the presence of a recent pulmonary infarct or systemic embolus we are of opinion that it is much safer to heparinize the patient for 2 to 3 weeks in an endeavour to prevent further thrombus formation and to encourage endothelialization of the pre-existent thrombus.

(4) *Sub-acute Bacterial Endocarditis.* This should always be adequately treated with antibiotics and at least 6 months of quiescence should pass before valvotomy is undertaken.

(5) *Aortic Stenosis.* If the aortic stenosis is dynamically important such cases have until recently, been rejected. To-day, however, the mitral stenosis is dealt with first and immediately afterwards the aortic stenosis is relieved—see Bailey *et al.*¹¹

B. Permanent Contra-indications

(1) *Gross Aortic Incompetence.* Up to 1950 Brock *et al.*¹² rejected all cases with an associated aortic incompetence. Nineteen of our patients (*vide infra*) have had an associated mild aortic incompetence. But if the aortic incompetence is gross or dynamically important, as shown by left ventricular enlargement, assessed clinically, radiologically and by electro-cardiograph, we do not, at the present time, advise operation.

(2) *Established mitral regurgitation.* To be absolutely certain that pure mitral regurgitation exists is at present difficult, but certain criteria, the subject of a further communication by Dr. M. McGregor,¹³ have thus far been of great value.

(3) *Age.* We have been reluctant to advise operation for those above the age of 55, but it seems that more important than the age is the duration of severe symptoms. Our youngest patient was 19 and our oldest 53.

CLINICAL EXAMINATION

Despite the imposing array of apparatus that fills cardiac clinics everywhere there is little to replace a careful history in assessing the need for operation nor anything that can substitute a careful clinical examination. In our cases we have been in the fortunate position of having the expert clinical opinion of the Cardiac Clinic of the Johannesburg General Hospital under the aegis of Professor G. A. Elliott. Our review of the clinical signs is taken entirely from their records.

1. *The Neck Veins* should be examined with the patient semi-recumbent and any venous congestion measured in relation to the angle of Louis. In the venous pulsation prominent 'a' waves suggest tricuspid incompetence; undue arterial pulsation in the carotids, an associated aortic incompetence. A 'carotid shudder' will indicate a combined aortic stenosis and incompetence.

2. *The Pulse* in mitral stenosis is characteristically of small volume due to the low cardiac output (52% of our cases). If collapsing it suggests a concomitant aortic incompetence (6% of our cases). (In pregnancy the pulse is often of good volume.) In 40% of our cases the pulse felt normal.

3. *The Blood Pressure* is somewhat lower than in a comparable series of normal individuals, but there is considerable variation.

4. *Cyanosis* in our cases has been uncommon. In one of

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our cases there was considerable central cyanosis, but disappeared 7 days after the operation.

5. *Auricular fibrillation* is common in well-established mitral stenosis, and was present at the time of operation in 34% of our cases. The pathology of auricular fibrillation is not properly understood but according to Logan and Turner its presence usually indicates severe myocardial damage. Its onset is an added indication for operation, as suggesting progression of the disease with added risk of systemic emboli from thrombus formation in the stagnant non-contracting left auricular appendage. Such cases should be adequately digitalized before operation.

6. *Inspection.* In some cases marked pulsation can be seen over the pulmonary artery in the second left inter-space, indicative of pulmonary hypertension. In others a heave can be seen para-sternally in the left 4th and 5th inter-space, due to hypertrophy of the underlying right ventricle. Occasionally the whole of the praecordium is seen to heave—this indicates that both ventricles are enlarged.

7. *Palpation.* The position of the apex beat is only a rough guide to cardiac size. It often bears little relationship to the heart size as seen radiologically. What is, in our opinion, however, more important is the character of the apex beat. In left ventricular hypertrophy there is an unmistakable thrust (16% of our cases). In uncomplicated tight mitral stenosis the apex has a tapping character (50%). In other cases the apex is palpable (2% cases). In 16% of our cases it was of normal character.

8. *Auscultation.* As surgeons we are often diffident in describing the quality and character of the classical murmurs. Besides the help of the physicians of the Cardiac Clinic we have had the good fortune to have phonocardiograms in most of our cases and are indebted to Dr. J. Greenstein for his help in this respect.

(a) *Apical Murmurs.* Mid-diastolic murmurs at the apex are indicative of mitral stenosis and have been recorded in 100% of our cases. (40% of cases of patent ductus have a functional mid-diastolic murmur.¹⁴) In all the cases but one, pre-systolic murmurs due to auricular contraction have accompanied the mid-diastolic murmur, except, of course, in those cases which are fibrillating.

An early diastolic murmur (i.e. commencing immediately after the second sound) at the apex is often due to aortic incompetence, in which case it is maximal para-sternally and is usually associated with a collapsing pulse, a thrusting apex beat and radiological and electrocardiographic evidence of left ventricular enlargement.

A systolic murmur at the apex was heard in 42% of our cases. Most commonly the murmur is due to mitral regurgitation, especially when it is of great intensity. The presence of a fine mitral systolic murmur does not, however, contra-indicate operation, for the dominant and dynamically important lesion is still likely to be stenotic. An apical systolic murmur, and indeed one maximal at the apex, may also be caused by aortic stenosis. Other corroborative signs should confirm the presence of aortic stenosis viz. poor peripheral circulation, anacrotic pulse, and palpable thrill and murmur to the right of the sternum.

(b) *Systolic Murmurs* maximal near the sternum may be due to tricuspid incompetence or stenosis, especially when associated signs of venous pulsation, pulsation of the right auricle to the right of the sternum and a pulsating liver are found. In one case with gross mitral regurgitation a well-marked tricuspid incompetence was present; it was not relieved by cardiomy. In others the functional tricuspid incompetence was relieved by mitral valvotomy.

(c) *Pulmonary Murmurs.* Early diastolic murmurs over the pulmonary area are due either to aortic or pulmonary incompetence. In 30% of our cases there was aortic incompetence, which in 8% more was combined with mitral incompetence, minimal aortic stenosis or pulmonary incompetence. When due to aortic incompetence the early diastolic murmur is very often conducted down the left border of the sternum to the apex, but when due to pulmonary incompetence it is only rarely conducted to the apex. Pulmonary-incompetence murmurs were present in 16% of our cases (10% associated only with mitral stenosis, one case—see above—with aortic incompetence and 2 cases with tricuspid incompetence).

(d) *Aortic Murmurs.* The early diastolic murmur of aortic

incompetence and the systolic murmur of aortic stenosis are most relevant in the diagnosis and assessment of mitral lesions. If they are dynamically significant mitral valvotomy might be useless or even dangerous—useless if the aortic leak is gross and marked left ventricular hypertrophy is present—dangerous in the presence of severe aortic stenosis unless this is first corrected. This is because following mitral valvotomy the added blood volume now entering the left ventricle will in aortic stenosis cause further embarrassment to the left ventricle, with ventricular failure.

(e) *Heart Sounds.* Accentuation of the 1st sound at the apex is usually heard when tight stenosis is present (78% of our cases). Its absence suggests that incompetence is the predominant lesion (6%). In 16%—earlier cases—no record is available.

Accentuation of the 2nd pulmonic sound was present in 74% of our cases. It indicates pulmonary hypertension. The second pulmonic was normal in 24% and no record is available in 2%.

The so-called opening snap of the mitral valve has been an important finding in our cases as an index of stenosis. Although it may be absent, according to Logan and Turner, when the valve and cusps are unduly rigid, its presence certainly indicates stenosis. An opening snap was heard in 74% of our cases and was absent in 20%, and there was no record in 6%.

(9) *Clinical Examination of the Lungs.* Normally the lungs are clear in mitral stenosis. During or after sudden pathological or physiological changes, however, lung or pleural changes are common. Crepitations may be heard during pulmonary oedema or after infarction. Three of our cases had crepitations in the left lower lobe, and the possibility that pressure from a grossly enlarged auricle on the left main bronchus may account for this is an interesting possibility—Schuster¹⁵.

Bronchitis in mitral stenosis usually indicates pulmonary oedema. Pleural effusion may be found following infarction and complicating cardiac failure. Peripheral signs of congestive cardiac failure, viz. venous congestion, enlargement of the liver and oedema of the legs, were seen in 48% of our cases.

RADIOLOGICAL FINDINGS

Clinical examination as detailed above is most important in the diagnosis of mitral stenosis and enables one to determine which ventricle is enlarged but not to determine enlargement of the left auricle. Accurate estimate of heart size can only be made on radiological examination, and this applies equally to chamber enlargement. Screening is a most important part of the radiological investigations and from it chamber enlargement, dynamic action of the ventricles, paradoxical systolic expansion of the left auricle, the state of pulmonary circulation and valvular calcification, can be gauged. Routine films should comprise postero-anterior, bucky posterior and the two oblique positions with barium swallow. A left lateral is also useful.

Heart size. We have used the cardio-thoracic ratio as an index of heart size and have found the following:

C.T.R.	35-40	2 cases
C.T.R.	40-45	6 cases
C.T.R.	46-50	17 cases
C.T.R.	51-55	13 cases
C.T.R.	56-60	6 cases (Fig. 1)
C.T.R.	61-65	3 cases (Fig. 2)
No records		3 cases

Auricular Appendage. The turgid enlarged left auricular appendage shows as a fourth contour on the left border of the heart below the pulmonary artery segment (Fig. 3). When prominent on X-ray the appendage has rarely been clotted; when small or absent (provided the heart is not immense) this suggested thrombus formation, which was confirmed at operation. A fourth contour due to the auricular appendage was present in 72% of our cases and absent in 18%, and we have no X-rays available to check its presence in 10%.

Pulmonary Artery. This is invariably enlarged in symptomatic cases of mitral stenosis (Fig. 4). The enlargement is rarely as great as that found (e.g.) in patent ductus arteriosus, though in a fair number it was considerable. If unduly promi-

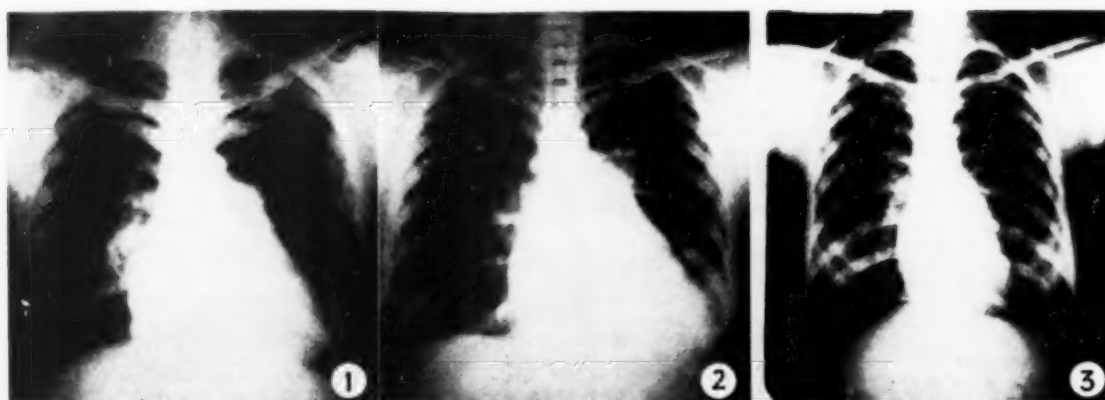


Fig. 1. Showing a C.T.R. of 58% and gross enlargement of the pulmonary artery segment.

Fig. 2. Marked cardiac enlargement with a C.T.R. of 64%. Pulmonary arteries very prominent, partly owing to repeated pulmonary infarcts.

Fig. 3. This shows a hypoplastic aorta in a woman of 20 with the auricular appendage showing as a fourth contour.

nent (Fig. 2) it suggests some other lesion such as pulmonary emboli. The pulmonary artery was enlarged in 80% of our cases and was normal in 14%, and no records are available in 6%.

Arch of the Aorta. This is usually hypoplastic when mitral stenosis appeared early in life, due no doubt to the diminished cardiac output. The arch is quiet on screening unless aortic incompetence is present.

Enlargement of the left auricle is best seen on a penetrating hard film when a double density extending to the right of the mid-line can be seen (Fig. 5). The enlarged left auricle also causes a backward displacement and indentation of the barium-filled oesophagus and fills up the angle below the left main bronchus (Fig. 6).

A double density was present in 78% of our series, and absent in 16%; there was no record in 6%. Backward displacement of the barium-filled oesophagus was present in 92% and negative in 4%; there was no record in 4% of cases.

Enlargement of the right ventricle and right ventricular outflow tract are best demonstrated as a forward bulging in the left anterior oblique view. If extreme it can displace the left ventricle backwards so as to overlie the spine, and a mis-

taken diagnosis of left ventricular enlargement can be made. In one patient the pre-operative diagnosis of mitral stenosis with radiological evidence of left ventricular enlargement was made. She died following ventricular fibrillation and autopsy showed that all the hypertrophy was in the right ventricle.

The right ventricle was enlarged in 66% of our cases, in 14% both ventricles were enlarged, and in 10% only the right ventricular outflow tract showed evidence of enlargement. In one case both ventricles and the outflow tract were enlarged. In a further 4% the findings were normal and in 4% X-rays were not traced.

Enlargement of the left ventricle is best shown on the right anterior oblique as a backward displacement of the ventricle so that it overlies the vertebrae (Fig. 7). Dynamic pulsation of the left ventricle is best seen on screening, enlargement on films suggests the presence of either or both aortic incompetence and mitral regurgitation. We have not operated upon any cases in which, radiologically, there has been evidence of left ventricular enlargement only.

Calcification of the mitral valves is best seen on screening and is of value in that the prognosis after valvotomy is not so good when this is present.



Fig. 4. This shows a marked increase in the pulmonary vascular pattern in a woman aged 35 with marked pulmonary hypertension.

Fig. 5. A Bucky P.A. film showing a double density due to an enlarged left auricle.

Fig. 6. Backward displacement of the barium-filled oesophagus due to an enlarged left auricle.

Paradoxical systolic expansion of the left auricle. For long it was thought that this radiological sign indicated mitral regurgitation. Our experience does not support this contention.



Fig. 7. Backward enlargement of the left ventricle due to concomitant aortic incompetence.

Lastly it cannot be sufficiently emphasized that although the presence of more than 3 of these signs is pathognomonic of mitral valvular disease their presence indicates advanced physiological and pathological change; and there must be a time when although the patient is severely incapacitated, chamber enlargement has not yet occurred (*Bailey 16*). In one case the only positive radiological findings were prominence of the pulmonary artery and possibly of the right ventricle. Catheterization nevertheless showed a rise with exercise in pressure in the pulmonary artery from a mean of 8 mm. Hg to a mean of 19, i.e. an increase of $2\frac{1}{2}$ times. The pressures had not returned to normal in 11 minutes. Mitral valvotomy was performed and at operation oedematous lungs, a turgid enlarged auricular appendage, and a tight mitral orifice, were found.

CARDIAC CATHETERIZATION

This was performed in all of Brock's first 100 cases (*Brock 17*) both before and after operation to establish certain points. We have not performed any post-operative catheterization, and as our clinical experience improved so we reduced the number of pre-operative catheterizations. In our first 20 cases 7 were catheterized and in the latter 30 cases only one. We now catheterise only those cases where the diagnosis is in doubt, where the symptoms are in excess of the clinical and radiological evidence, and where important concomitant heart lesions may co-exist, e.g. Lutembacher's syndrome (mitral stenosis with patent interatrial septal defect).

ELECTROCARDIOGRAPHY

The most common electrocardiographic abnormality found in established cases of mitral stenosis is evidence of right ventricular hypertrophy, which has been present in 56% of our cases. In 50% there has been evidence of the so-called '*P mitrale*', indicating left auricular enlargement. In 34% auricular flutter. One patient showed a right bundle block. Four per cent of the cases were normal and in 4% the electrocardiograms are not available for evaluation.

PRE-OPERATIVE TREATMENT

Having been accepted for mitral valvotomy, our patients are given a salt-free diet, are adequately digitalized if there is fibrillation and are given mercurials if there is any evidence of congestive cardiac failure. After admission to the nursing home the following regime is carried out:

1. A fluid intake and output chart is kept and the diet is kept salt free.

2. A dose of quinidine is given to test for sensitivity in case

it becomes necessary to use quinidine during or after operation.

3. If there is any suspicion of congestive failure mercurials are given with ammonium chloride capsules. The day before operation a mercurial diuretic is always given.

4. If there is much sputum, culture and sensitivity tests are carried out and the appropriate antibiotics given. If little sputum is present supercillin (300,000 units of leocillin and $\frac{1}{2}$ g. of streptomycin) is given twice daily for 4 days before operation.

5. Breathing exercises are given by a trained physiotherapist.

6. They are then put into a ward where a post-operative valvotomy is convalescing.

7. They are told that when they return from the theatre they will have an oxygen mask on, an intravenous drip running in their fore-arm, and a catheter draining their chest.

8. A sedative is prescribed the night before operation and, as we operate in the afternoons, another sedative is given in the morning (usually grs. 3 of seconal).

9. They are kept head elevated en route from ward to theatre.

THE OPERATION OF MITRAL VALVOTOMY

A cut-down intravenous drip of 5% dextrose in water is set up in the distal left forearm and care is taken that the patient is propped up on the table when this has been necessary before operation.

We have been fortunate in our anaesthetists. Dr. C. Frost has given 19 of the anaesthetics, Dr. F. W. Roberts 16 and Drs. Nicholson, Rosenberg, Ford, Kramer and Varese the others. We are indebted to Dr. Frost for the following short description of the anaesthesia used in his cases.

Pre-Medication usually consists of:

Seconal Gr $1\frac{1}{2}$	$1\frac{1}{2}$ hours pre-op.
Omnopon Gr $1\frac{1}{3}$	1 hour pre-op.
Atropine Gr $1/100$	1 hour pre-op.

On the patient's arrival in the theatre procaine is added to the dextrose water to produce a 0.2% solution. The rate is adjusted to about 30 drops per minute and this is continued throughout the operation. Anaesthesia is induced with pentothal sodium and tubarine given separately and the patient is kept well oxygenated. The larynx is then cocainised under vision, and a large cuffed endotracheal tube introduced. This is connected to a Waters' absorber and anaesthesia is maintained with nitrous oxide and oxygen 2:1 with fractional doses of pethidine and pentothal sodium as indicated. Before the pleura is opened controlled respiration is commenced using small doses of Tubarine. During the intracardiac stage of the operation pure oxygen is given. When the chest is closed spontaneous respiration is permitted and assisted until adequate. As a rule by the time the patient leaves the theatre, respiration is satisfactory, and prostigmine is *not* given as a routine. Blood is only given to replace loss and overloading of the circulation avoided. The small amounts of drugs which these patients require, has been striking. If blood pressure at the end of the operation is low, small doses of methedrine are given.

An electrocardiogram machine is connected to the patient and this we have found invaluable during the course of the more protracted and difficult valvotomies. Blood is kept in series with the intravenous dextrose drip, but less than the blood lost is replaced for fear of adding too much saline. A long thickbore needle is also available in case an intra-aortic transfusion becomes necessary but in the two cases that died of haemorrhage this was of no avail. After we had lost our sixth case from ventricular fibrillation we stopped operating until an electrical defibrillator was obtained and this is now available for all our chest cases. Its presence has thus far been necessary in only one case where it proved life-saving.

In this series we have used an anterior 4th intercostal incision with wide spreading of the 4th and 5th ribs by means of a Fienochietto retractor. We have persisted with this incision in preference to the more extensive lateral incision for several reasons, viz., (1) we have found the exposure adequate in all but one case, (2) the patient lying supine with a pillow under the posterior left chest and shoulder can readily be put in the reverse Trendelenburg position, (3) the exposure is not time-consuming, (4) closure is readily accomplished.

LATERAL APPROACH

We feel, however, that the lateral approach through the fifth interspace has several advantages: (1) more adequate exposure for alternative procedures. If an entry cannot be made through the left auricular appendage an alternative portal of entry can be utilized via the left superior pulmonary vein. In the case mentioned above the anterior approach prevented our utilizing this alternative. (2) Although the anterior approach is rarely uncomfortable post-operatively, in several cases they have had protracted and severe pain at the site of operative dislocation at the chondro-sternal junction. (3) In women the anterior approach with some upward reflection of the breast is followed by some hypo-aesthesia of the mamma which they find displeasing.

Once the pleura is opened 5 ccs. of 1% anethaine is injected into the pericardium. Procaine for this purpose is useless as it is not a surface anaesthetic. The internal mammary vessels are ligated and the rib-spreader inserted. The lungs are examined and any free fluid aspirated. In some cases the lungs have been solid with oedema despite preparation. Others have shown localized parietal pleural adhesions, the site of previous infarcts. The extra-pericardial portion of the great vessels are visualized and through the intact pericardium the auricular appendage can be seen. The pericardium is then opened longitudinally in the line of and anterior to the phrenic nerve (in 2 cases posterior to it). The intrapericardial portion of the great vessels is inspected for increased tension, size, and in the case of the pulmonary veins thrombosis. In some cases the pulmonary artery has been immense and under considerable tension.

Tactile examination of the heart is now carried out. The left auricular appendage is very carefully examined. Normal contraction takes place in the non-fibrillating subject. By palpation one can determine whether there is a systolic thrill suggesting mitral regurgitation or absence of pulsation with a solid feel indicating thrombus formation, which was found in 26% of our cases. In several other cases loculated clot was suspected but found to be hypertrophied auricular trabeculae. In aortic regurgitation a thrill is felt over the base of the left ventricle, laterally, just over the mitral valve, i.e. just below the left auricular appendage. The thrill of aortic stenosis is felt at the root of the aorta. The characteristic diastolic thrill of mitral stenosis is felt at the apex.

An estimate is now made of the relative size of the ventricles, remembering how far the right ventricle comes over to the left. Any enlargement of the left ventricle would suggest the presence of aortic stenosis or regurgitation or mitral regurgitation. Numerous other points are noted to exclude other heart lesions, previous coronary infarction, or calcification in the coronaries. No case has yet been found with calcification of the left auricle. A Brock's auricular clamp is now placed on the base of the appendage, which is opened by a longitudinal incision on its lateral aspect near its tip. All trabeculae crossing its lumen are carefully divided with Pott's aortic scissors—if necessary the clamp is re-applied proximally to ensure that all of these are sectioned. Lack of this precaution was, we feel, the cause of death by haemorrhage from the auricle in one case at the time of insertion of the right index finger. If clot is found this is first carefully dissected off the lateral wall of the appendage and the clamp momentarily released; if no blood is ejected the dissection is proceeded with on the medial side until blood is seen issuing from the left auricular appendage. The clamp is now re-applied as proximally as it is safe to do. The clot is loosened to the clamp, the finger inserted as the clamp is released, the clot loosened at a deeper level with the finger, which is now withdrawn and several hundred ccs. of blood allowed to escape from the auricle, thus washing out some of the clot. In a case subsequent to this initial series a fresh clot $1\frac{1}{2}'' \times 1\frac{1}{2}''$ was evacuated in this way. The operation now proceeds as though there were no clot. The right index finger is

introduced through the aperture in the incised appendage and as the finger slides in the clamp is removed. In this way the finger acts as a bung and blood loss is minimal. The tip of the finger now explores the auricular chamber. If further clot is found on its wall this is not disturbed and the anaesthetist momentarily compresses the common carotids at the time of valvotomy to prevent cerebral embolisation. The mitral orifice is next investigated and any regurgitation noted. In our earlier cases we often recorded a minimal jet-like regurgitation but either our standards of assessing regurgitation have altered or we now pass these as normal. The valve cusps are next palpated for calcification, nodularity and movement, and the commissures are examined. Then the size of the orifice itself is estimated as admitting the tip of the finger, the tip of the nail, base of the nail or second knuckle. If the orifice admits the finger proximal to the second knuckle major regurgitation is diagnosed. We have aimed at performing only an antero-lateral commissurotomy, in this way splitting or rather separating the adherent valves to the mitral ring until the proximal knuckle (a circumference of 7.5 c.ms.) can comfortably be accommodated. The antero-lateral commissure is palpated and pressure is exerted by the pulp of the finger along the line of the commissure thus ensuring commissurotomy only. Often an alarming sudden complete split to the valve ring takes place but these cases usually prove most successful. At other times several attempts have to be made to start or complete the split. If one fails with the finger alone it is withdrawn, armed with a Brock's mitral valvotomy knife and then re-introduced into the auricle. The cutting edge of the knife is then applied under tactile digital control and a cut made into the commissure. The knife is then withdrawn into its sheath and the valvotomy completed by finger pressure. We believe that the method of 'pushing through' the finger advocated by some surgeons may be dangerous. By this 'push through' procedure the valves will usually separate at the commissures, but there are two dangers. Firstly the cusps may tear if fusion of the commissures is marked, and mitral regurgitation can result. Secondly it is possible in the elastic type of valve to push or dilate the valve temporarily without performing commissurotomy. We have succeeded in performing successful valvotomy in 46 cases. In two the valves were elastic and we could not obtain a satisfactory split and in two others haemorrhage occurred before this was accomplished. In one case valvotomy was not obtained, even in the autopsy room.

After commissurotomy the finger is withdrawn from the auricle and by slightly hooking the finger the auricular appendage is lengthened and the clamp applied to its base as the finger is withdrawn. Interrupted white mattress silk sutures—No.0—are then used to close the appendage. The clamp is now slowly released and if bleeding occurs its site is closed by a further suture. If only slight oozing takes place the clamp is removed and a moist swab placed over the suture line. Experience has shown that the slack between the sutures is taken up in this way and oozing from the sutures ceases after a few minutes of light pressure.

Blood is now sucked out of the pericardial and pleural cavities and the upper 4/5ths of the pericardial incision closed with interrupted 'O' chromic sutures. The lower 1/5th is left open for drainage into the pleural cavity. A million units of penicillin and 1 g. of streptomycin is left in the pleural cavity, which is drained routinely by a catheter connected to an underwater seal. Four lengths of braided Swedish wire are now passed through the 4th and 5th ribs, which are thereby approximated. The intercostal plane, muscles, subcutaneous tissue and skin are sutured and a dressing applied. Before the patient leaves the table all the peripheral pulses are examined for emboli and the bloodpressure taken again. If the systolic level is below 100 mg. Hg 4 minims of methedrine are given in the drip and repeated twice at 5-minute intervals if necessary.

OPERATIVE FINDINGS

In two cases the pleura was adherent on opening the chest and one case had a large effusion. The lungs were markedly oedematous in 29 cases and bronchiectasis was palpable in 3 left lower lobes. The pulmonary vessels appeared under tension in 44 of the cases. The auricular appendage appeared normal in 3, was clotted in 13 and was turgid in 34. Calcification of the valve cusps or commissures was palpable in 13 cases. Regurgitation was the major lesion found at operation in 5 cases and was minimal in 14 others.

POST-OPERATIVE TREATMENT

The patient is returned to the ward with an oxygen mask, the head of the bed elevated and the blood pressure and pulse charted every fifteen minutes until the former is stabilised at about 100 systolic. If the pressure continues to fall further injections of methedrine are given. If there is no response and there are no signs of haemorrhage a noradrenaline drip of 4 cc. of 'levophed' in a vocolite of dextrose replaces the dextrose drip. As soon as the blood pressure is maintained 3 g. of procaine are added to each litre in 12 hours. This is given to allay pain and prophylactically to prevent arrhythmias. Morphia gr. 1/8 is exhibited for pain during the night time and pethidine by day. The general condition of most of the patients on the morning of the first post-operative day is very satisfactory. A portable erect radiograph in inspiration and expiration is taken and the intercostal catheter removed unless drainage is excessive, as it has been where the lungs have been markedly oedematous. Breathing exercises and leg movements are encouraged, but little fluid is given by mouth on that day. As soon as urine is voided indicating normal kidney function, a diuretic is given—i.e. if 4 to 8 oz. of urine have been passed and 2 cc. if more than 8 oz. have been voided. Antibiotics are given until the first dressing on the 8th day and a vitamin B preparation and 500 mg. of ascorbic acid are given by injection for the first 5 post-operative days. A pint of yoghurt is given by mouth for the whole period to minimise the risk of moniliasis. Heparin has been used post-operatively by drip and later by Gordh needle in the presence of an embolus or where fresh clot has been found in the auricle. In one case where a saddle-aortic embolus and a cerebral embolus occurred from a thrombus extending on to the valve orifice, heparin was started 6 hours after completion of the operation. That this early heparinization is fraught with danger we have little doubt, as another case similarly treated died from unrecognized acute cardiac tamponade (autopsy showed 90 cc. of blood in the pericardium). Nevertheless each case must be treated on its merits and our patient with an aortic embolus rapidly regained a full circulation with normal lower limbs.

Although our other thoracic surgical patients are ambulant from the first post-operative day, we have kept our valvotomies in bed for the first week. Thereafter a graduated course of walking exercises and steps is instituted so that by the end of the second week the average case is walking 25 yards and climbing 10 steps 6 times a day. As 3 cases have developed post-operative auricular fibrillation as late as the 12th day we have preferred to keep most in hospital till the 16th day. On return home their doctors have been asked to guard the patient against excessive activity, which they are prone to undertake because they feel so well. Tennis has been allowed some of the younger patients within 3 months and intercourse much earlier.

POST-OPERATIVE COMPLICATIONS

There were no complications in 18 cases. There were 3 cases each of transient cyanosis, auricular fibrillation, lobar atelectasis and minor wound infection. There were 2 immediate post-operative emboli—1 cerebral and 1 combined cerebral and saddle-aortic embolus. There was one delayed saddle-aortic embolus occurring on the 11th post-operative day in a chronic fibrillator aged 53, who died following aortic embolectomy performed by a colleague. There were 2 cases each of transient auricular flutter (responding to quinidine) and of transient congestive cardiac failure; and 2 of severe post-operative pain, one persisting 6 months after operation. There was 1 case each of the following complications: (1) Urinary retention, relieved by catheterization and a portable commode. (2) Pethidine idiosyncrasy in a patient who remained deeply comatose with widely dilated pupils for 2 hours after operation and thereafter made an uncomplicated recovery. (3) A pulmonary embolus in a woman of 47 occurring on the first day after operation. She had had several infarcts before operation. (4) Auricular tachycardia persisting for the first 10 days after operation. (5) Severe melaena from a previously proven duodenal ulcer. (6) Diarrhoea in a patient who was given terramycin prior to admission. (7) A massive effusion necessitating aspiration of the left pleural cavity on 2 occasions. (8) Homologous serum jaundice occurring several months after transfusion.

OPERATIVE MORTALITY

We have had 7 deaths (i.e. a mortality of 14% in this first series), 5 occurring in the first 30 cases and 2 in the last 20 cases*:

Age	Rhythm	Complication
48	Regular	Ventricular fibrillation on table.
37	A.F.	Ventricular fibrillation on table and 48 hours after operation.
45	A.F.	Haemorrhage from auricular appendage.
43	Regular	Haemorrhage from auricular appendage.
34	A.F.	Reactionary haemorrhage due to heparin.
47	A.F.	Pulmonary embolus.
53	A.F.	Saddle-aortic embolus.
5 deaths in 14 cases over 40 years ...		36% mortality.
2 deaths in 36 cases under 40 years ...		5.5% mortality.
5 deaths in 17 cases with auricular fibrillation ...		30% mortality.
2 deaths in 33 cases with normal rhythm ...		6% mortality.

It appears then from this small series that age and fibrillation are adverse factors, for there have been no deaths in 25 cases with regular rhythm under the age of 40.

What is of even greater importance is that 3 of 4 patients return to normal life—Graham.¹⁸

CONCLUSIONS

Mitral stenosis is a disabling disease recognizable clinically and capable of relief by comparatively simple and safe surgical procedures.

The symptoms, signs, operative findings and results of 50 such cases are detailed.

It is impossible to thank individually the members of the Cardiac Clinic and X-ray Department of the Johannesburg General Hospital and the many physicians who have made this series possible. To Dr. Maurice McGregor, however, we owe a special debt of gratitude for his diagnostic acumen, his never-failing help in the pre- and post-operative treatment of these cases, the academic interest and his presence always stimulated and the assistance that he so gladly gave in compilation of this paper. We would like to express our appreciation to Dr. Arnold Jackson and Dr. Graham McLeish for their encouragement early in this series and to the staff of the Lady Dudley Nursing Home, especially Sister Vigrass in the theatre, Sister Coetzee in charge of the Ward, and Sister du Preez who specialized most of these cases.

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* There have been no deaths in the author's last 30 consecutive cases.

A THORACIC SURGEON LOOKS AT MITRAL STENOSIS

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Cardiac surgery has reached maturity after a very brief adolescence, and procedures which were considered beyond the realm of possibility only a few years ago are to-day accepted as everyday procedures. Modern cardiac surgery can be said to have commenced with the first ligation of a patent ductus arteriosus by Richard Gross of Boston in 1938. Alfred Blalock then startled the medical world with the brilliance of conception and performance of his anastomotic procedures in congenital heart disease. These procedures blazed the trail for the surgery of conditions more commonly seen. Brock has underlined the British contribution to heart surgery with his brilliant direct intra-cardiac approach to the problems of congenital pulmonary stenosis. However, it is with the more recent development of surgical procedures for the treatment of acquired heart disease that cardiac surgery has made the greatest strides.

MITRAL STENOSIS

Foremost amongst these conditions is mitral stenosis. Although previous attempts had been made to relieve narrowing of the stenosed mitral orifice (as first contemplated by Sir Lauder Brunton in 1902), notably by Cutler and by Souttar, who in 1925 apparently performed a successful valvotomy, it was the work of Harkens of Boston and Bailey of Philadelphia, after the last war, which re-established interest in the problem. Mitral stenosis is now almost entirely in the surgeon's province. After one has palpated the stenosed mitral orifice in the living patient and found it reduced to a diameter of half a centimetre, and even to the size of a match-head, one cannot fail to be impressed by the logic of relieving this stenosis. The position is comparable to that of any other obstruction. The amazing clinical benefits following surgical relief are among the most gratifying experienced by the surgeon.

The changes in the myocardium following on a rheumatic pancarditis are now recognized, in general, to be completely reversible. The endocardium of the mitral leaflets is thought to become swollen and inflamed in the acute phase of the disease and the swollen edges in contact are traumatized and eventually adhere. Very frequently, in 80-90% of cases, the only damage the valve leaflets sustain is at the zones of contact, and one is left with thin supple valves and adherent commissures leaving a grossly stenosed orifice. If the commissures can be re-constituted such valves would function normally and efficiently without mitral incompetence. In 10-20% of cases gross scarring and deformity of the valves and chordae tendinae occur and although the orifice can be enlarged, perfect function cannot be anticipated. It used to be taught that the most important factor causing decompensation of the heart in mitral stenosis was the myocardial damage sustained during the rheumatic infection and that the damaged valves were of secondary importance. The present more rational concept is that the initial myocarditis subsides and the heart is left with an obstruction at the site of the mitral orifice.

The degree of stenosis of the orifice is remarkably constant, which has been explained by Brock on an anatomical basis, as being due to the site of insertion of the chordae tendinae. The left auricle by dilatation and hypertrophy is at first able to maintain an adequate blood-flow through the mitral orifice, but gradually a back-pressure develops and is transmitted to the pulmonary circulation, with development of pulmonary hypertension and eventual dilatation and hypertrophy of the right side of the heart. The myocardium may be able to carry on for years pumping against what amounts to an incomplete obstruction, but eventually the myocardium suffers in the process and tends to fail. For example, auricular fibrillation frequently develops and congestive cardiac failure often follows. Such a damaged myocardium can never return entirely to normal, but if the obstruction is relieved it is able to function satisfactorily. Digitalis may have to be employed indefinitely but many of these people with auricular fibrillation lead a most active existence after valvotomy. If the obstruction is relieved before significant myocardial damage has occurred one can anticipate virtual normal return of function.

OPERATION

I need not go into any great detail over the technique involved; suffice to state that an opening is made in the appendix of the left auricle and a finger is inserted acting both as the operating medium and as a cork. In approximately 80% of cases pressure exerted by the tip of the finger at the sites of the fused anterior and posterior commissures will cause the zones of fusion to split, resulting in freeing of the valve cusps. Occasionally a knife must be employed to divide this zone of adherence, especially in cases in which there is calcification. Naturally, it is important not to tear the valve cusps. The procedure is definitely not a dilatation as so many doctors consider it to be. It is apt to be frightening both to the doctor and patient and to be considered a very dangerous procedure. This was true with the serious type of case that was first tackled; but with the development of a satisfactory technique, and with increasing skill and familiarity with the procedure, even the serious case can be done with a much lower risk than at first appeared possible.

Naturally enough, following the success obtained with the more severe degrees of mitral stenosis, surgeons have received more favourable material and the risks are less. I quote as an example my own series, at present consisting of 33 cases. The very first case was that of an extremely ill woman just out of congestive cardiac failure, on whom operation should probably never have been attempted. She died of ventricular fibrillation before the incision into the chest wall had been completed. Apart from this case there has been only one other death in the series. This was due to a pulmonary embolus 24 hours after operation. The last consecutive 25 cases have been free of any incident. The resulting mortality in a series comprising both good and bad risks is thus 6%, and excluding the

first unfortunate case it is 3%. Only one case has been complicated by dislodgment of an embolus. Hemiplegia developed but completely resolved within 2 weeks apart from a limitation of the peripheral fields of vision.

There is probably less risk in performing a mitral valvotomy on these patients than in performing any other major surgical procedure on them; at the completion of the operation one has a heart that is no longer obstructed, and is capable of normal function. Apart from the first case, we have not encountered the dreaded complications of ventricular fibrillation or cardiac standstill and have not had occasion to employ our electrical defibrillator. This I ascribe to the skilled administration of anaesthesia by Drs. H. Grant-Whyte and A. A. Cilliers, the basic principle being adequate oxygenation.

SELECTION OF CASES FOR THE OPERATION

One can briefly say all cases of mitral stenosis should be considered for the operation. Some cases will be obviously too ill and the risks be too great. Cases with the apex beat palpable in the mid-axillary line and with greatly hypertrophied hearts are obviously grave surgical risks and real improvement can hardly be expected.

In many cases the disability may be so slight that the medical advisers are justifiably reluctant to recommend what is a very major operation. We do not advise operation in cases that are completely asymptomatic, but obviously these patients should be kept under surveillance in case disability does eventually develop. The case that is obviously going downhill must be considered. Similarly, the patient who cannot undertake full normal activity; there is no reason to-day why the patient should be left to lead a very restricted life, unable to play games, climb stairs or hills, or, speaking of certain female patients, bear children. A young girl with mitral stenosis who is about to be married should definitely be considered, although she may be virtually asymptomatic. We have asked the gynaecologists to consider 'unsterilising' certain of our patients following successful valvotomy. The gynaecologists appear to find it a difficult problem. Valvotomy should even be considered for women with mitral stenosis who are fairly advanced in pregnancy; successful cases have been reported up to the 6th or 7th month.

There are many cases with only minimal disability that should be considered, because of the generally unfavourable prognosis, for it is exceptional for these people to reach old-age. A recent tragic case can be cited: a young girl of 20 was considered to be an ideal subject for the operation—she had minimal symptoms and minimal cardiac enlargement and had never been in congestive failure; in fact one of her medical advisers considered the operation unnecessary. The operation was postponed for a few days because of the onset of her menses, and required further postponement because she developed a temperature the night before the contemplated operation. This appeared to be nothing worse than so-called 'flu'—blood cultures were performed and were negative. She was discharged to her home under the care of her doctor to await complete resolution of this infection before re-admission for surgery. A week or so later she went into congestive cardiac failure for the first time, and, despite skilled attention and care, her condition could not be improved and she died. This girl had a tight

mitral stenosis, and but for the unfortunate onset of menses, would be alive and well to-day. Another case developed a severe pulmonary infection one week after operation. It may have been a pulmonary embolus, but was thought to be a straightforward lobar pneumonia. He was very ill for a few days but was able to overcome a condition which would probably have proved fatal prior to valvotomy.

When congestive cardiac failure or embolic episodes have occurred, when orthopnoea, nocturnal dyspnoea, haemoptyses and other manifestations of pulmonary hypertension are present, or when auricular fibrillation has developed, the problem is one of some urgency. Until recently we excluded children and adolescents on the ground that rheumatic activity was possibly still present or liable to recur. However, biopsies of auricular muscle in many successful cases, in some series up to 25%, have revealed Aschoff nodes, which have been regarded as pathological evidence of activity. These cases have apparently come to no harm. I have recently undertaken the operation in several children, the youngest 8 years of age, whom we considered unlikely to survive for more than a year or two without surgical relief. The operative procedure was well tolerated, convalescence was uneventful, and, the follow-up at 6 months has been very gratifying. Recurrence of the rheumatic fever will have to be anticipated and stenosis may again develop, when we may have to consider operating again eventually. This type of case is naturally undertaken only when essential, and in general we are pursuing a conservative policy with children with mitral stenosis who appear to be well compensated.

The ideal surgical risk is the case with minimal cardiac enlargement apart from an enlarged left auricle. One must be careful to evaluate the degree of the cardiac neurosis which is encountered in many cases of mitral stenosis, but if the radiologist can demonstrate left auricular enlargement, and if there is electro-cardiographic demonstration of right-sided strain, we must consider the symptoms to be genuine.

Cases demonstrating marked pulmonary hypertension as evidenced by pulmonary congestion and an enlarged pulmonary-artery-segment on X-ray, or an accentuated second sound over the pulmonary area, or a history of orthopnoea, haemoptysis, nocturnal dyspnoea etc., give the most dramatic and immediate results. Frequently, within a day or two these patients are found to be lying flat in bed without disability. At operation in this type of case it is usual to be able to demonstrate a distinct lessening of tension in the pulmonary artery and left auricle once valvotomy has been accomplished, and one can confidently forecast a dramatic improvement.

CONTRA-INDICATIONS

Cases with grossly enlarged hearts are bad surgical risks. We have tackled successfully several cases with enlargement of all four chambers and one case with an aneurysmal left auricle, but I consider myself to have been very fortunate and, generally speaking, am most reluctant to undertake this type of case.

Aortic incompetence with a water-hammer pulse is to my mind a definite contra-indication. Aortic incompetence diagnosed on the basis of a diastolic murmur at

the base of the heart and without definite left ventricular enlargement or a high pulse-pressure can be discounted, for the murmur may be simulated by the Graham Steele murmur of pulmonary incompetence. Cases of tricuspid stenosis have been successfully tackled, but I have had no personal experience with this type of case. Aortic stenosis has been a contra-indication, but since Bailey of Philadelphia has devised a means to tackle this problem satisfactorily, it no longer necessarily applies. As yet we have not had to undertake this type of case.

In the selection of cases the question of a possible mitral incompetence is most important. We hesitate to operate on cases in which we feel incompetence is the main feature. A certain degree of mitral regurgitation is almost an essential feature of mitral stenosis with a rigid orifice, and once the valves have been freed it should be diminished in amount. However, some cases with deformed valves may be rendered more incompetent by valvotomy. To the best of our knowledge this has not occurred in any of our cases. Three or 4 of our cases have had what appeared at operation to be a not inconsiderable degree of regurgitation associated with some stenosis. These cases have done well after valvotomy and it appeared that the degree of regurgitation had not been increased. The post-operative results have been excellent, but a longer period of follow-up is required. I personally feel that if both stenosis and incompetence are present it is probably worth while performing a valvotomy, but one must be guarded in the eventual prognosis.

However, it is probably correct to state that it is unwise to operate on cases with predominant incompetence, although all cardiac surgeons will be able to quote cases of almost pure incompetence that have done well. One case in my series has illustrated this very well, and we are at a loss to explain the resulting benefit apart from its possibly being due to strong psycho-therapy.

The problem is how to diagnose mitral incompetence. Despite all the skill of the cardiologist, it is not at all easy. So-called criteria such as a muffled first sound at the apex with a blowing systolic murmur, radiological demonstration of systolic expansion of the auricles etc., are not at all conclusive, and in several of our cases where we had made the presumptive diagnosis of mitral incompetence no regurgitation at all was detectable. The one feature I consider unfavourable is an enlarged left ventricle. However, this is not always easy to determine. A heaving apex beat would make one suspicious. A straight X-ray of the chest frequently shows a suggestive cardiac contour, when in reality it is an enlarged right ventricle that causes the appearance of left ventricular enlargement. However, an experienced radiologist can usually make the differentiation. Frequently, the electrocardiogram proves of assistance in demonstrating a predominantly right-sided enlargement. One must be very cautious with the 'mitral' heart demonstrating a left axis deviation on the E.C.G. If aortic regurgitation and stenosis and hypertension can all be excluded, an enlarged left ventricle probably signifies considerable mitral incompetence. If one is still in doubt it is wisest to operate, as probably less harm will result from exploring a case of mitral incompetence than from not relieving a case of mitral stenosis.

Cases demonstrating obvious rheumatic activity are best avoided, with the exceptions previously mentioned. In any event the patient's condition must be improved as much as possible. I have had no experience with subacute bacterial endocarditis, but obviously the risks of surgery even after medical treatment are considerable.

MISCONCEPTIONS

While not professing to be a cardiologist, I have been startled by the misconceptions held by many practitioners. I have already stressed that the operation is not a dilatation of the mitral orifice, but a definite attempt to return to the *status quo ante* by freeing the commissures and thus regaining two free independent valve leaflets. Some doctors cannot diagnose mitral stenosis. Several cases with a pure systolic murmur have been referred for treatment. We have only one definite case proved at operation to be a mitral stenosis in which a rumbling diastolic murmur was not audible. Phono-cardiogram confirmed the absence of the diastolic murmur.

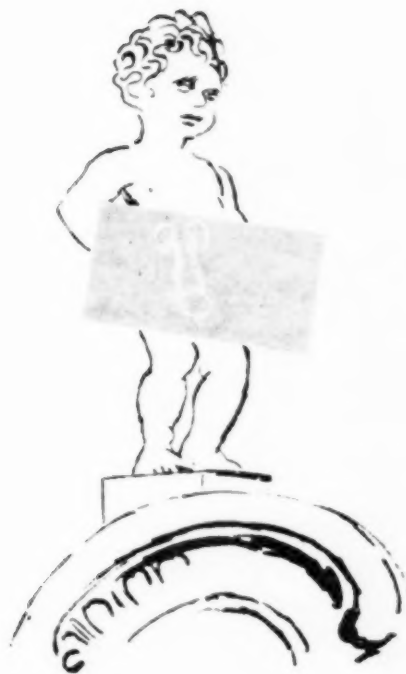
A question frequently asked concerns the possibility of re-adherence of the valves—one can only state that in the 5- or 6-year follow-up at present available, this has apparently not been reported. Furthermore, it is unlikely to occur unless there is a recurrence of the rheumatic condition. A factor against adherence is that ventricular diastole is nearly twice as long as systole and that therefore the valves are open proportionately longer.

Another doubt expressed has been whether the relatively undeveloped left ventricle will be able to cope with the increased circulation. To the best of my knowledge this fear is quite groundless.

The recent developments in heart surgery have stressed the fact that we still have much to learn about cardiac physiology and, in particular, the mode of production of heart murmurs. Many cases with definite clinical improvement reveal no alteration in the cardiac murmurs, while in other cases the diastolic murmur disappears. In general I have found that the murmur disappears in the cases with thin, supple valve-cusps in which I have been able to free both commissures adequately. Probably the murmur tends to persist in cases where both commissures have not been completely freed and in which grossly thickened cusps are present. Adequate freeing of both commissures is the ideal but is not always practicable nor even necessary, as demonstrated by the results obtained of incomplete valvotomies. In certain poor-risk subjects it is better to be satisfied with an incomplete valvotomy than to persevere unwisely.

In conclusion, I would like to say how important it is that physicians should realize that surgery in mitral stenosis has much to offer and that they should not restrict the consideration of operation to cases that do not respond to medical treatment.

Since this article was written the author has performed mitral valvotomy in a further 20 cases without operative mortality. One patient died on the 8th day and autopsy revealed multiple pulmonary emboli and a markedly atheromatous pulmonary artery. This was probably a case of irreversible pulmonary hypertension. One patient developed a cerebral embolus with hemiplegia, which is showing signs of rapid resolution. The remaining 18 cases were uneventful.



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THE SURGICAL TREATMENT OF MITRAL STENOSIS*

WALTER L. PHILLIPS, M.R.C.P., F.R.C.S.

Thoracic Surgeon, Cape Town

New methods of treatment have instituted radical changes in the course and outlook of mitral stenosis. The public unfortunately receives a great deal of inaccurate information, not only from the lay press but also from patients who have been treated. The general practitioner, who will be confronted with the many problems concerned with this disease, must be in a position to advise his patients and correct any misapprehensions which exist.

Incidence. In hospital practice mitral stenosis accounts for 50% of all cases of heart disease. Paul White has estimated that approximately 1% of the American population suffers from valvular disease, as a sequel to rheumatic fever. This percentage cannot be less in Great Britain, and probably holds for most parts of the world.

Rheumatic fever occurs more frequently in women than in men, and consequently the incidence of mitral stenosis is higher in the female sex.

PATHOGENESIS

Rheumatic fever, the cause of mitral disease, usually occurs in early childhood, and may present as a polyarthritis of a characteristic type, as an attack of chorea, or as a vague undiagnosed illness. The cardiac complications in many instances occur shortly after the attack of rheumatic fever. Frequently, however, the lesion develops in later years, and may only be discovered a considerable time after the initial illness.

Thorough treatment, which is essential in the acute stages of rheumatic fever, may prevent the onset of cardiac complications, but there is no specific therapy which will definitely preclude their occurrence. One should also bear in mind the fact that in very acute cases cardiac damage may be present from the onset of the disease.

There have been no material changes in the treatment of the early stages of rheumatic fever, and the use of salicylates remains the main stand-by. The acutely fulminating cases, which formerly ended fatally, can to-day be helped by the administration of cortisone and ACTH. There is no evidence, however, that these drugs will prevent the onset of cardiac sequelae.

Rokitanski (1852) believed that the heart valves were thickened as a result of the deposition of substances from the blood, which subsequently were converted into fibrous tissue, and that the same process caused the cusps to become adherent to one another.

The present-day theory, suggested by Magaery, is that organization occurs of repeated deposits of fibrin on the surface of the valve and in the commissures between the cusps, and that these changes are not dependent on cicatricial contraction within the substance of the valve. The same process of fibrin deposit and organization would account for the shortening of the chordae tendinae.

It must be remembered, of course, that when the heart is affected the whole heart is involved and not only the mitral valve. Fortunately, in most cases, mitral stenosis is the only resultant lesion. A number of cases, however, show involvement of the other cardiac valves.

DIAGNOSIS

The great diagnostic difficulty is to determine whether there is incompetence in the valve as well as stenosis. Pure or greatly predominant mitral incompetence can usually be detected by physical and radiological examination, but when the mitral incompetence is associated with significant mitral stenosis the diagnosis may be more difficult.

Mitral Stenosis

The auscultatory findings are of major importance in the diagnosis of mitral stenosis.

Murmurs. The mid-diastolic murmur has the following characteristics. It can be best heard at the apex, remembering that when it is faint it may be confined to a very small area. The patient should be in the recumbent or the left lateral position. The murmur is usually low-pitched and rumbling in character.

In the early stages of this condition the murmur is entirely mid-diastolic, but as the stenosis progresses, or as the heart rate increases, it may begin in mid-diastole and continue right up to the first sound, giving a presystolic accentuation.

Tachycardia, due to exertion, often makes a murmur more evident.

The accentuation of the second heart sound in the pulmonary area is all-important, as an indication of increased pressure, though it does not invariably occur.

X-ray Appearances. The radiographic examination of the heart and its consequent interpretation requires considerable experience.

Left auricular enlargement is marked in almost every case, and may be seen in the postero-anterior view as well as the left lateral view. The pulmonary artery and its major branches are almost always enlarged, and their size gives an idea of the tension in the pulmonary vascular bed.

Enlargement of the right ventricle occurs in the majority of cases, but at times is difficult to assess. The lung fields as a rule show an increased vascular pattern, and occasionally multiple calcifications are seen. The left ventricle is not enlarged in cases of mitral stenosis.

Electro-cardiographic Changes. Evidence of left auricular hypertrophy and enlargement may be shown by changes in the P wave. Right axis deviation is usual but not invariable.

Cardiac Catheterization. This investigation is not essential, but it does provide information which is interesting and experimentally valuable. One should not expect

*A lecture delivered to the Worcester Medical Association 30 October 1953.

cardiac catheterization to provide a solution when the ordinary investigations have failed to establish the diagnosis of mitral stenosis.

Mitral Incompetence

Pure mitral regurgitation is not difficult to diagnose; it can usually be readily detected by physical and radiological examination. Mitral incompetence associated with mitral stenosis may cause diagnostic perplexity, though there are several physical signs which should arouse suspicion.

Apical Systolic Murmur. A pure apical systolic murmur of moderate degree suggests the presence of regurgitation.

A soft first heart sound and opening snap of the mitral valve is also significant, particularly when it is associated with left ventricular enlargement and a very large auricle as evidenced on X-ray examination.

X-ray examination with barium in the oesophagus may show the presence of paradoxical movement. Systolic contraction of the ventricle associated with distension or dilatation of the auricle is characteristic of mitral regurgitation.

Ordinarily a slight degree of mitral incompetence does not contra-indicate surgical treatment, and the case can be handled as if it were one of pure stenosis.

PULMONARY CHANGES DUE TO MITRAL STENOSIS

The first effect of stenosis of the mitral valve is to produce pulmonary congestion, which accounts for the patient's being unable to carry out ordinary exertion and having to sleep propped up with pillows at night. The anxieties of haemoptyses or the effects of water-logging of the lungs are constantly present. These symptoms are primarily due to pulmonary engorgement, and it is only later that the effects of pulmonary hypertension lead to changes in the lung parenchyma.

Consequent on the obstruction to the mitral valve there is left auricular enlargement with an increase in the pulmonary vascular pattern, and eventually the rise in pressure in the pulmonary circuit is transmitted to the pulmonary artery, which may undergo great enlargement, producing a marked shadow in the radiograms.

A peppered appearance of the lungs on X-ray examination is a sign of the effects of haemosiderosis in cases of long-standing pulmonary engorgement.

Thus we see that the radiographic changes in mitral stenosis, which commence in the heart, finally involve the lungs.

SIGNIFICANCE OF SYMPTOMS

The main and early symptom of mitral stenosis is progressive dyspnoea, which at first may be hardly noticeable, but later affects the patient on the slightest exertion. The reason for introducing this section on symptoms is to indicate that with the progression of the disease there is an increase in the severity of the symptoms, which explains the changes in rhythm due to auricular fibrillation, the appearance of congestive heart failure, the signs of peripheral embolism, the attacks of acute pulmonary oedema and haemoptyses.

Grouping of Patients. The assessment of the severity of the condition can be facilitated by the following symptomatic grouping.

Group 1 includes these cases in whom the course of the

disease is still benign, the patients having the physical signs of mitral stenosis but few symptoms.

Group 2 includes patients showing some handicap due to dyspnoea. Occasionally attacks of acute dyspnoea follow effort and, rarely, oedema may be present. There is definitely no evidence of right ventricular failure.

Group 3. In this group the patients show increasing disability. There is definite dyspnoea on effort, with easily-provoked attacks of haemoptysis, chest pain, and pulmonary oedema. Palpitations and tachycardia are common complaints. On palpation discomfort over the liver region may be elicited.

Group 4 patients belong to the well-advanced stage, in which pulmonary oedema, pulmonary infarction, and severe dyspnoea are the chief and distressing symptoms.

Group 5 provides the terminal group, in which the patient is completely incapacitated, usually with right heart failure, and frequent embolic manifestations. Most of these patients show auricular fibrillation, though auricular fibrillation itself does not place the patient in this group, as it frequently occurs in groups 3 and 4.

SURGICAL TREATMENT

Before the advent of cardiac surgery, there was no satisfactory treatment for mitral stenosis. To-day, through surgery, we are able to obtain not only symptomatic relief but in many instances a complete cure.

History. The treatment of mitral stenosis by means of surgical measures was first discussed in 1902, but it was not until the early 'twenties that Cutler of Boston performed a series of operations on animals and subsequently on man designed to partly excise the cusps of the stenosed mitral valve. Cutler actually devised an instrument which was introduced through the wall of the ventricle, and while in 1923 he reported the recovery of a patient after one of his operations his subsequent results were disappointing.

Soutar recorded a successful operation on a stenosed mitral valve by means of digital dilatation.

It was only after the second World War, however, that Harkin of Boston attempted to operate on the mitral valve through the left auricular appendage or a branch of the pulmonary vein.

In recent years, Sellors and Brock in England have reported on their successful results of surgical operations on the mitral valve, and the modern technique is based mainly on their experiences.

INDICATIONS FOR VALVOTOMY

The grouping of patients as described above helps in their appraisal. Patients in group 3 are definitely suitable for surgical treatment. Group 2 cases should be thoroughly reviewed, as the patients are not so severely handicapped. Many patients in this group, however, are now being treated. Group 4 patients should be very carefully assessed, because the majority of them are already in too advanced a stage for surgical treatment.

The type of case most suitable for valvotomy is the case of tight mitral stenosis with relatively little incompetence and with secondary pulmonary hypertension, a powerful right ventricle, and occasional symptoms of paroxysmal cardiac dyspnoea. The cardiac output is

usually strictly limited and rises only a little on effort. Pulmonary congestion is intense and results in a reflex dyspnoea.

About 10% of all cases of mitral stenosis take this course, and mitral stenosis itself accounts for about 10% of all cases of organic heart disease. Hence, approximately 1% of all cases of heart disease should benefit by mitral valvotomy.

It should be emphasized that before surgical treatment is instituted there should be no evidence of activity of rheumatic infection, nor likelihood of further activity; that is to say, operation should not be performed too soon after an attack of rheumatic fever. It is most important that the patient has a course of medical treatment in preparation for the surgical procedure. It is amazing to see the response to controlled medical treatment, and often enough patients come to the surgeon so improved that they are a little dubious about the necessity for operation. On the other hand, patients have died from pulmonary oedema whilst waiting admission to hospital for valvotomy.

No attempt will be made in this paper to deal with the treatment of pulmonary oedema, congestive cardiac failure, auricular fibrillation, or pulmonary infarction. It should be remembered, however, that patients awaiting treatment may develop pulmonary oedema, and in order to minimize this risk it is advisable to employ dehydrating measures, including mercurial diuretics and a low sodium diet. Patients with a normal rhythm are given digitalis in order to give them some protection should they develop fibrillation, particularly after operation.

Valvotomy in Pregnancy. Numerous cases have been reported where valvotomy was performed during pregnancy without interfering with the viability of the foetus. The problem is the timing of operation. In the termination of pregnancy after the 3rd month a patient with a grade-3 mitral stenosis undergoes as great a risk as she would with a mitral valvotomy at that stage. Therefore, even in the early stages of pregnancy, if the mother is already showing severe effort-dyspnoea, or has complained of attacks of pulmonary oedema or haemoptysis, she should have her valvotomy irrespective of the fact that she is pregnant.

Surgery in the Prophylaxis of Mitral Stenosis. It has already been stated that patients in Group 2 are now being subjected to surgical operation. These patients show evidence of dyspnoea on effort, and it is known from experience that the symptoms will progress. The question is whether the patient should wait until she is bad enough to have the operation, because naturally there are attendant risks, or whether the operation should be done early in the course of the disease to avoid possible complications.

At a recent Cardiology congress in Europe not one speaker advocated surgical treatment as a prophylactic measure for patients with symptomless stenosis, nor was there any suggestion that such early operations are justifiable to avoid later damage to the pulmonary vascular tree.

OPERATIVE PROCEDURE

Pre-operative Preparation. Apart from the preparation to improve the patient's general condition (see above), pre-operative treatment is designed to prevent arrhythmias developing immediately after surgical treatment.

Even if there is no evidence of cardiac failure, mercurial diuretics and digitalis, estimated according to the weight of the patient, should be administered before operation.

The Operation. It is not my intention to describe the operation of valvotomy in detail in this paper, but a few salient points must be mentioned. The operation should be performed by a surgeon plus a team of trained assistants. The anaesthetic is of the usual type employed in major thoracic surgery. During the operation it is desirable, though not essential, to have a continuous electrocardiographic recording, which means that an expert physician should be present to report on the changes due to arrhythmia or ischaemia.

The valvotomy itself is done through the left auricular appendage, and careful pre-operative assessment will already have informed the surgeon of the size of the auricular appendage. Furthermore, pre-operative X-ray examination may have shown the presence of calcification of the mitral valves.

It is only at the actual time of operation that the surgeon can decide whether valvotomy can be performed by simple finger fissure, or whether incision of the valves with a valvotome is necessary.

At the end of the operation a mixture of antibiotics is placed in the pleural cavity to minimize the risks of super-added infection.

Operative Mortality Rates. The operation itself should carry virtually no mortality. This will naturally depend on whether the patient is in Group 2, 3 or 4. The general condition of Group-4 patients is so poor that the operation itself carries a 10% mortality.

Effect of Operation. Patients are usually impressed with the improvement in their breathing within a few days of operation. Some soreness due to the incision in the chest wall may be present, but generally there is an uninterrupted convalescence.

Post-operative Complications

(1) *Post-operative Embolism.* Patients with a previous history of pulmonary embolism run a greater risk of this complication occurring post-operatively. Frequently, when the auricular appendage is opened organizing thrombi are found, and the actual manipulation of the valve may cause some of this material to pass into the systemic circulation. The risk of this sequela can be minimized if the anaesthetist provides pressure to the neck arteries during the actual time of the valvotomy. A large clot is frequently found when the auricular appendage is opened up, and if the blood is allowed to flow freely the clot is washed away into the pleural cavity.

Cerebral or peripheral palsies may develop from systemic embolism, and if these are recognized early enough, and are suitably situated, surgical removal may prove efficacious.

Post-operative pulmonary embolism may result from stasis of the systemic circulation.

(2) *Cardiac Arrhythmia.* Occasionally a normal rhythm may be changed into auricular fibrillation as a result of the manipulation of the cardiac muscle. This can usually be corrected with quinidine, and is of no great significance.

(3) *Pericardial Effusion.* This is a frequent occurrence,

and the effusion should be aspirated if it causes any cardiac embarrassment. If left it will disappear spontaneously.

(4) *Mitral Incompetence.* If the chordae tendineae are damaged a mitral regurgitation may result. This most unfortunate complication is untreatable, and should not occur if reasonable care and skill are exerted.

RESULT OF VALVOTOMY

As a result of valvotomy 70% of patients are markedly improved, 20% are slightly improved, and 10% are unaffected. These statistics clearly indicate that there is everything to be gained by having the operation when careful assessment shows that correct indications exist.

IN MEMORIAM

DR. ANDREW FLEMING-BERNARD

Dr. Andrew Fleming-Bernard, Laird of Dunsinnan, first Medical Director of Southern Rhodesia and founder of the Colony's health services, died in Edinburgh on 6 November 1953. His death, states the *Rhodesia Herald* breaks one of the last links with the pioneer days of public health and medical services.

Born in Scotland in 1871, Andrew Fleming, as he was then, took his M.B., C.M. at Edinburgh University in 1893, and, after working as assistant to Sir Robert Philip in the first tuberculosis dispensary ever established, came out to Kimberley for family reasons in 1894.

While in Kimberley he made friends with Sir Charles Coghlan, afterwards first Premier of Southern Rhodesia, and later accepted an invitation from Dr. Jameson to go to Salisbury as a medical officer in the employ of the British South Africa Company. For some months after his arrival he was the only medical officer between Umtali and Bulawayo.

In 1896 he returned to Scotland to marry Miss P. Fisher. When he returned to Rhodesia with his wife, the 1896-97 Mashonaland rebellion had begun and Mrs. Fleming's trousseau was captured by hostile Natives.

For his services in the Rebellion, during which he was in charge of the laager in Salisbury and responsible for a large part of the surgery for wounded and injured, he was awarded the C.M.G. As he was only 26 at the time, he was probably the youngest man ever to receive the award. At the time of

his death he was the most senior member of the Companionship of the Order.

In 1898, Dr. Fleming was made Medical Director for the Colony of Southern Rhodesia, Inspector of Hospitals, and Principal Medical Officer of the British South Africa Police. He was responsible for all major surgical work in Mashonaland, and, starting with nothing, he had to provide the Colony with a medical and nursing service and hospitals. While on leave in 1903, he obtained his D.P.H. at Cambridge, and his F.R.C.S. Edinburgh.

He served in the First World War in Russia and Poland, fighting typhus and dysentery epidemics.

When he retired in 1931, after 37 years' service, he had been responsible for the design and establishment of hospitals at Salisbury, Umtali, Gwelo, Gatooma, Fort Victoria, Shamva, Sinoia and Belingwe. He had established two nursing training schools, and created health laboratory services at Salisbury and Bulawayo. He had also been responsible for drafting all the basic public health legislation of the Colony.

After his retirement, Dr. Fleming practised for some years at Mazoe, until he became Laird of Dunsinnan (the Dunsinane of Shakespeare's *Macbeth*), and returned to Scotland to live on the estate. It was at this time that he assumed the name of Fleming-Bernard.

He is survived by a son—a former Rhodes Scholar—and a daughter.

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JOHANNESBURG

Dealer's Fair, with demonstrations and talks on the subject. Lunches and dinners have been arranged on ships in harbour.

The papers that have been submitted vie with the latest in the fields of Medicine and Surgery anywhere in the world, and the congress promises to be an outstanding success.

There are as yet not enough papers to complete the Sec-

tions and an appeal is made to more members of the Association to submit their names as contributors. This may be done direct to the Medical Secretary, Dr. I. Gordon, Sanlam Buildings, Port Elizabeth.

Visiting members are also reminded to reserve their hotel booking early through the S.A. Tourist Bureau or their nearest Station Master.

COMPOSITION OF THE MEDICAL COUNCIL

With the announcement of the names of the 10 medical practitioners elected as members of the South African Medical and Dental Council, the composition of the full Council, which will remain in office for the five years ending 31 December 1958, is as follows:

Appointed by the Minister:

Five medical practitioners:

Dr. J. J. du Pre le Roux, Secretary for Health.
Dr. I. R. Vermooten, Commissioner of Mental Hygiene.
Dr. C. J. G. Venter, M.O. to the S.W. Africa Administration.
Dr. S. F. Oosthuizen.
Dr. J. van Schalkwyk.

One dentist:

Dr. R. V. Bird.

Two laymen:

Mr. J. F. Ludorf.
Mr. W. H. Rood.

Appointed by the Universities:

Four medical practitioners:

Dr. M. van den Ende (Cape Town).
Dr. G. W. Gale (Natal).
Dr. L. J. de Groen (Pretoria).
Dr. G. A. Elliott (Witwatersrand).

Two dentists:

Dr. H. H. Louw (Pretoria).
Dr. J. C. M. Shaw (Witwatersrand).

Appointed by the South African Nursing Council:

Two nurses:

Miss C. A. Nothard.
Mrs. C. Searle.

Elected members:

Medical practitioners:

Dr. J. Black.
Dr. A. Bloom.
Dr. L. I. B. Braun.
Dr. E. H. Cluver.
Dr. R. L. Impey.
Dr. J. N. W. Loubser.
Dr. A. Radford.
Dr. C. Shapiro.
Dr. M. Shapiro.
Dr. A. H. Tonkin.

Dentists:

Dr. J. H. Breyer.
Dr. J. W. E. Graham.
Dr. R. Hofmeyer.
Dr. J. A. Stegmann.

Mr. Wm. Impey, Secretary of the Medical Council and Returning Officer in the recent election of Medical Practitioners, announces that in the election 3,247 voting papers were sent in—a 53.3% poll of the 6,089 medical practitioners entitled to vote. The 10 medical practitioners elected were:

Black, James.
Bloom, Arthur.
Braun, Loswel Israel Braude.
Cluver, Eustace Henry.
Impey, Robert Lancelot.
Loubser, Johannes Nicolaas Willem.
Radford, Aubrey.
Shapiro, Charles.
Tonkin, Arnold Hugh.

The votes cast in the election were as follows:

Black, James	1,392
Bloom, Arthur	1,190
Braun, Loswel Israel Braude	1,186
Bremer, Julius Karl	1,100
Cluver, Eustace Henry	1,310
Davel, Johannes Gerhardus Albertus	409
Deale, Eric William Swain	940
De Villiers, Johannes Philippus	796
De Wet, Johannes Marthinus Benjamin	738
Du Toit, Jacob	647
Du Toit, Jacobus Stephanus	882
Green, Cyril Arnold Howell	835
Impey, Robert Lancelot	1,196
Kleinman, James	508
Lawrance, Wilfrid Hudson	478
Loubser, Johannes Nicolaas Willem	1,018
Nel, Izak Zirk Gerhardus	475
Proksch, Francis Bruwer	524
Radford, Aubrey	1,345
Schneider, Tobias	784
Shapiro, Charles	1,046
Shapiro, Maurice	1,241
Tandy, Guy Terence	897
Theron, Jacob Johannes	642
Tonkin, Arnold Hugh	1,057
Van Niekerk, Jacob Jozua	686
Vercueil, Leon Olivier	1,124
Wagner, Philipp Frederick Henry	832
Wilson, Vernon Hindmarch	463

PASSING EVENTS : IN DIE VERBYGAAN

Mr. N. Kretzmar recently attended the congress of the International Society of Surgeons in Lisbon and visited surgical clinics in England and Holland. He has now returned to Kimberley and has resumed his practice at his old address, 101 Dutoitspan Rd.

A SOURCE OF VITAMIN C

The juice of the guava fruit, which is the richest known natural source of vitamin C, is now being canned and is available even when the fruit itself is out of season. More than one firm is putting the canned product on the market.

The best varieties of the guava contain as much as 1,000

mg. of vitamin C per 100 g. of fruit, and the poorest varieties have as much as 200 mg. The manufacturers of one brand of canned guava juice state that the vitamin C content of the product varies between 250 and 450 mg. per 100 g., the variation being due to the differing content of the fruit.

The product is natural guava juice sweetened with sugar and preserved with added sodium benzoate. It is not boiled during processing.

LECTURE BY EMINENT PSYCHIATRIST

Dr. H. Yellowlees, the eminent British Psychiatrist, will be in South Africa in January next year on a visit, and he has

kindly consented to give a lecture to the Southern Transvaal Branch of the South African Society of Physiotherapists at Medical House, Esselen St., Johannesburg, at 8 p.m. on 11 January.

Dr. Yellowlees' subject will be 'Word and Action' and the Society, feeling that the lecture will be interesting and informative, would be pleased if any doctors who are interested would attend.

UNION DEPARTMENT OF HEALTH BULLETIN

Report for the seven days ended Thursday, 3 December 1953.

Plague: Nil.

Smallpox: Orange Free State. One (1) Native case in the Welkom municipal area.

Typhus Fever: Orange Free State. One (1) European case in the Kestell municipal area. Diagnosis confirmed by laboratory examination.

Cape Province. No further cases have been reported from the Queenstown district since the notification of 5 November 1953. This area is now regarded as free from infection.

Epidemic Diseases in other Countries.

Plague: Nil.

Cholera in Bombay, Calcutta, Nagapattinam, Visakhapatnam (India); Chalna, Dacca (Pakistan).

Smallpox in Bombay, Cochin, Delhi, Kanpur, Nagapattinam (India); Haiphong, Saigon-Cholon (Viet-Nam).

Typhus Fever in Cairo (Egypt); Baghdad (Iraq).

Report for the seven days ended Thursday, 10 December 1953.

Plague: Nil.

Smallpox: Natal. No further cases have been reported from the Umzinto district since the notification of 12 November 1953. This area is now regarded as free from infection.

Typhus Fever: Cape Province. No further cases have been reported from the Tsolo district since the notification of 12 November 1953. This area is now regarded as free from infection.

Epidemic Diseases in other Countries.

Plague: Nil.

Cholera in Madras, Tiruchirappalli (India); Chalna, Dacca (Pakistan).

Smallpox in Bombay, Cochin, Delhi, Kanpur, Madras, Nagapattinam (India); Haiphong, Saigon-Cholon (Viet-Nam).

Typhus Fever: Nil.

CORRESPONDENCE : BRIEWERUBRIEK

DOCTORS AND PARKING OFFENCES

To the Editor: A letter by a colleague in the *Rand Daily Mail* contained a complaint that, though he was attending to an emergency, the representation he made to the Johannesburg Traffic Department was disregarded and he was fined for a parking offence. I feel that the representation was made in a routine manner by letter and that the Traffic Department dealt with the matter in a routine manner, while the Chief Traffic Officer, Brigadier A. A. Hayton, was not consulted. I am sure Brigadier Hayton has not forgotten the 'gentlemen's agreement' made long ago, even if the badge on our cars does not give us the 'freedom of the city'. This, however, I feel we must leave to our City Councillors. It is not the Chief Traffic Officer and his senior men who are responsible, but the City Council.

Now, Sir, no ambulance will be ticketed when on emergency duty, but the doctor, who was on genuine emergency, received no co-operation from the police. Such co-operation is routine in large cities everywhere in the world.

The Medical Association is also to blame. Why issue badges if they have no standing? Surely such cases should be defended by the Association. Fortunately many of us are members of the Automobile Association, which takes an interest in the protection of its members. Such action should certainly be the duty of the Association and should not be left to anybody else.

Perhaps our newly elected colleague will prove a good councillor and get the present state of affairs put in order.

Quousque tandem abutere patientia nostra?

Johannesburg,
4 December 1953.

OPLEIDING VAN MEDIESE STUDENTE

Aan die Redakteur: Gedurende die afgelope paar maande is van verskeie kante kritiek uitgespreek oor die opleiding van geneesher in Suid-Afrika. Nog onlangs het die Minister van Volksgeondheid, Dr. A. J. R. van Rhyen in Johannesburg, by geleentheid van die grade-plegtigheid (volgens *Pretoria News*, 3 Desember) gesê: 'While it is necessary then for the family doctor to have a working knowledge of all the specialties, it is even more necessary that he should have a wide knowledge of the social, economic and environmental circumstances which surround his patients.' Hy het verder die mediese skole aangeraai om die leerplanne te hersien om in hierdie behoefte te voorsien.

Kort daarna het prof. S. F. Oosthuizen, Voorsitter van die S.A. Geneeskundige Raad, by geleentheid van die grade-plegtigheid in Pretoria (volgens *Pretoria News*, 5 Desember) gesê: 'The psychological symptoms is to the sufferer just as important as the organic symptom. . . . It is estimated that half the patients in consulting rooms were organically healthy and that they suffered from psychological symptoms

in which medical practitioners had no interest. . . . The lack of interest by us creates a serious problem and needs improvement and investigation. There is a vacuum in our professional equipment which is harming us.'

In die S.A. Geneeskundige Tydskrif van 24 Oktober 1953 spreek Dr. R. S. Verster in 'n artikel 'The Training of Doctors' 'n verdoemde oordeel uit oor die hele stelsel van geneeskunde. Hy sê o.a.: 'The student must be taught that psychotherapy is just as effective and positive a therapy as giving the patient a pill or an injection.' Hy kon daarby gevoeg het, ook 'n operasie. Sy artikel was 'n openbaring, komende veral van 'n sjirurg, en ons is hom dank verskuldig daarvoor.

In persoonlike gesprekke met dosente aan mediese skole is daar taamlik algemene instemming met bostaande menings. Verlede jaar, by geleentheid van die Mediese Kongres, is die saak uitvoerig bespreek en sekere besluite is geneem. Mag ek vra wat van die besluite geword het? Is dit nie na die Federale Raad verwys nie?

Ek wil spesiaal die aandag vestig op die toestand in Pretoria en aan die hand daarvan 'n paar vrae stel.

Die psigiatriese dienste in die Pretoriase Hospitaal is baie onbevredigend. Dit word behartig deur twee beampes van Weskoppies-hospitaal vir Sielsiektes, en net een is 'n geregi-streerde psigiater. Gesamentlik word ongeveer 5 uur per week aan die dienste gegee en dit in 'n groot opleidings-hospitaal. Hierdie twee beampes doen wat hulle kan, maar erken dat dit onmoontlik is om die werk by benadering behoorlik te behartig. Studente woon nooit hierdie klinieke by nie. Terwyl erken word dat die opleiding van die studente geen gebrek ly wat die psigotiese toestande betref, kry die studente geen praktiese opleiding wat die emosioneel-bepaalde siektes en die psigo-neurose betref nie.

Verder is die twee beampes van Weskoppies-hospitaal nie amptelik aangestelde amptenare van die Pretoriase Hospitaal nie en word hulle dus nie deur die Provinsiale Administrasie besoldig nie.

Ek wil graag twee vrae stel:

1. Hoe lank gaan die betrokke outoriteite, wat ten volle bewys is van die leemtes, hierdie toestand gedog? Is daar niemand wat die leiding sal neem of moet daar eers weer 'n kommissie van ondersoek ingestel word?

2. Hoe beskou die Mediese Vereniging, in beginsel, die feit dat twee voltydse Uniale Mediese Beampes betrekings beklee aan 'n Provinsiale Hospitaal, en dit sonder dat die poste ooit geadverteer is en geen besoldiging daarvoor ontvang word nie? Wat is die standpunt van die S.A. Geneeskundige Raad? Hierdie onwettige situasie gaan al vir jare aan, terwyl daar twee privaat praktiserende psigiaters in Pretoria is.

D. du Plessis.

Van Riebeeck Mediesegebou 106
Pretoria.
7 Desember 1953.

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TENIAFUGE

TENAMID is a recently discovered non-toxic anthelmintic. It is orally administered and effective against *Tenia solium*, *Tenia saginata*, *Necator americanus*, *Hymenolepis*, *Dipylidium caninum*, *Botriocephalus latus*, *Trichocephalus* and *Ascaris*, in a high percentage of cases reported. One course of treatment (12 tablets) is usually sufficient to expel the parasites completely. No special diet or purgatives are necessary. Full particulars sent on request.

TENAMID tablets of 0.5 gram in tubes of 12 and bottles of 100.



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Salisbury, P.O. Box 1691.



The Medical Association of South Africa Die Mediese Vereniging van Suid-Afrika

AGENCY DEPARTMENT : AGENTS-KAP-AFDELING

JOHANNESBURG

Medical House, 5 Esselen Street, Telephone 44-9134-5, 44-0817
Mediese Huis, Esselenstraat 5. Telefoon 44-9134-5, 44-0817

ASSISTENTE/PLAASVERVANGERS VERLANG ASSISTANTS/LOCUMS REQUIRED

(L/V424) Locum required for three weeks during January or February. Very easy practice, practically no night work. O.F.S. hospital town.

(L/V445) O.V.S. Plaasvervanger benodig vir een maand vanaf middel Desember of vir Januarimaand. Salaris £2 12s. 6d. per dag alles vry en 1s. per myl reistoelae in distrik.

(L/V448) O.V.S. Plaasvervanger vir Januarie. Salaris £2 12s. 6d. per dag, alles vry en 'n kar word verskaf.

(L/V449) Transvaal. Assistent om so spoedig moontlik te begin. Salaris £75 p.m. en ander voorwaardes om gereël te word. Met oog op vennootskap. Snykundige ondervinding sal 'n aanbeveling wees.

(L/V459) Randse dorp. 'n Tweetalige assistent word verlang. Oog op vennootskap. Salaris £720 per jaar, alles vry, plus 'n deel van netto inkomste.

(L/V477) O.V.S. Plaasvervanger vanaf 15 Desember tot 15 Januarie. Salaris £100 p.m. plus alles vry. Verkieslik beginner.

(L/V478) Johannesburg. Locum for February. Salary £3 3s. 0d. per day, all found, plus a car allowance. Preferably experienced man.

(L/V481) Tvl. town. Locum as from 4 January for three weeks. Terms: £20 p.w. plus all found and a car allowance.

(L/V484) O.V.S. Hospitaaldorp. Assistent word verlang vanaf 1 Januarie 1954. Salaris vir beginner £80 p.m. plus vry petrol en olie en diens van kar, plus 3d. per myl reistoelae.

(L/V485) Transvaalse hospitaaldorp. Assistent om so spoedig moontlik te begin. Aanvangsalaris £75 p.m. en ander voorwaardes om gereël te word. Na ses maande word 'n derde deel van inkomste aangebied.

(L/V4800) Reef hospital town. Assistant with at least two years experience. Definite view to partnership. Must be bilingual and have own car.

(L/V487) Plaasvervanger vanaf einde Desember of vroeër vir een maand. Salaris £2 12s. 6d. per dag, alles vry en 'n kar word verskaf.

(L/V491) Randse hospitaaldorp. 'n Assistent met vorige ondervinding om op 1 Februarie 1954 te begin. Salaris £120 per maand. Moet eie losies en petrol betaal. Laasgenoemde is omtrent £10 per maand. Moontlikhede van vennootskap vir die regte persoon.

(L/V494) O.F.S. Locum as from 21 December till end January or the full month of January. Terms and allowances to be arranged.

(L/V495) Reef hospital town. Assistant required to start 1 January. Salary £70 p.m., living out allowance £15 p.m., car allowance £10 p.m. plus free petrol and oil. Will suit newly qualified man.

(L/V497) Mine locum, near Johannesburg, as from 21 December till 10 January. Salary £3 3s. per day, £27 10s. p.m., travelling allowance and free board and lodging.

(L/V498) Praktijk naby Johannesburg. 'n Assistent om so spoedig moontlik te begin. Uitstekende vooruitsigte vir iemand met ondervinding. Salaris en toelae om gereël te word. Chirurgie word onderneem.

KAAPSTAD : CAPE TOWN

Posbus 643, Telefoon 2-6177; P.O. Box 643, Telephone 2-6177

PRAKTYKE TE KOOP : PRACTICES FOR SALE

(1484) WESTELIKE PROVINSIE. Uitstekende geleentheid om praktyk in hospitaaldorp te bekom. Besonderhede op aanvraag.

(1498) WESTERN PROVINCE hospital town within 100 miles

of Cape Town. 3 Appointments. Excellent scope for surgery. Average receipts 1950/51/52 £3,461 p.a. Premium £3,000 includes drugs, most surgery furniture and certain instruments. House and surgery also for sale. 6 months' introduction.

(1539) Noord-Kaapland. Goedgevestigde eenmanspraktyk met kontant-inkomste vir die laaste boekjaar van £2,377 17s. 8d. Premie £1,250 insluitende medisynes, instrumente en spreekkamermeubels. Ook spoorwegaanstelling. Woning en spreekkamers teen billike huurgeld.

(1446) Transkei. Half-share of well-established practice in beautiful and pleasant township with mild climate. Electricity. Waterborne sanitation. Easy reach of sea. Premium for half share £3,750 which includes half-share of newly built 5 roomed surgery standing on a big plot of ground, drugs, half-share of Chevrolet van and goodwill. House for sale at £1,800. Bond available.

OPHTHALMIC PRACTICE FOR SALE

(1325) Excellent opportunity to acquire expanding practice with 2 appointments. The area served is enormous and the population is steadily becoming specialist conscious. Present income approximately £3,000 per year. Possibilities for expansion are exceptionally good.

ASSISTANTS REQUIRED ASSISTENTE/VERLANG

(1502) Western Province. Assistant as soon as possible for 3-6 months with a view to partnership. Salary to be arranged.

(1515) Kaapstadse Voorstad. Assistent met oog tot vennootskap. Salaris £70-£80. Moet Afrikaansspreekend wees.

LOCUMS URGENTLY REQUIRED FOR URBAN AND RURAL AREAS. FULL DETAILS ON APPLICATION.

* * *

DURBAN

112 Medical Centre, Field Street. Telephone 2-4049

PRAKTYKE TE KOOP : PRACTICES FOR SALE

(PD23) Natal. Prescribing practice particularly suitable for a woman doctor interested in obstetrics and gynaecology. Total gross receipts for 1950, £1,570; 1951, £1,595; 1952 (6 months), £1,340; 1953 (3 months), £382. Premium £1,250, includes furniture, fittings, instruments, drugs and existing book debts.

(PD24) Natal South Coast. Practice suitable for doctor who does not want full-time work. £250 for drugs, dressings, instruments, etc. No charge for goodwill. Small house on 1 morgen, £1,600. Immediate occupation.

LOCUMS REQUIRED

(72) Durban. Locum required for January and February with view to assistantship. General practice. Salary to be discussed with the Principal.

(73) Near Durban. Locum for January and February. £2 12s. 6d. per day, all found. Must have own car.

(74) Zululand. Locum for February. £2 12s. 6d. per day, all found. Own car necessary.

(75) Durban. 1 January. Locum view to assistantship/partnership. General practice. Salary to be discussed.

Praktyk te koop

Oostelike Kaapprovinsie. Plattelandse dorp met klein blanke hospitaal. Dit is grotendeels 'n natuurlike praktyk en derhalwe kontant inkomste. Baie min boekskulde. Maandelikse inkomste £180-£200. Baie min nagwerk en operasies. Kans vir uitbreiding. Premie £700 insluitende voorraad medisyne £300 kontant en die res kan afbetaal word. Skryf aan 'A. T. U.', Posbus 643, Kaapstad.

Municipality of Oudtshoorn

NOTICE No. 98 OF 1953

APPOINTMENT OF PART-TIME MEDICAL OFFICER OF HEALTH

Applications are hereby invited and will be received by the undersigned up to 12 noon on Monday, 4 January 1954, from Medical Practitioners for the position of Part-time Medical Officer of Health for the Municipality of Oudtshoorn.

The Agreement as to duties and terms of appointment may be seen at the office of the undersigned during usual office hours.

The emoluments attached to the appointment are:

£130 per annum covering the services of the Part-time Medical Officer of Health, plus £144 per annum for work performed at the Venereal Diseases and Tuberculosis Clinics.

The appointment of Part-time Medical Officer of Health shall be subject to the approval of the Minister of Health.

Canvassing in the gift of the Council will be a disqualification.

Municipal Offices
Oudtshoorn

F. C. Dods
Town Clerk
2776-n11,14

Provincial Administration of the Cape of Good Hope

LADY MICHAELIS ORTHOPAEDIC HOME, PLUMSTEAD

VACANCY : PART-TIME MEDICAL OFFICER

Applications are invited from registered medical practitioners for appointment to the post of Part-time Medical Officer at the above-mentioned institution with remuneration at the rate of £90 per annum.

The appointment will be for an indefinite period, but may be terminated by three calendar months notice in writing on either side.

Applications reflecting particulars of age, qualifications, experience, etc. should be forwarded to the Medical Superintendent of the Wynberg Orthopaedic and Convalescent Hospitals, Central Office, 58 Loop Street, P.O. Box 1487, Cape Town, to reach him not later than 5 January 1954.

(A560624)

Assistant Wanted

Assistant with view to partnership in well-established general practice in best part of Cape Peninsula. Reply, giving full details to 'A. T. W.', P.O. Box 643, Cape Town.

Provincial Administration of the Cape of Good Hope

SOMERSET HOSPITAL

APPOINTMENT OF TWO HONORARY ANAESTHETISTS

Applications are invited from registered specialists and general practitioners for appointment to two posts of anaesthetists on the Honorary Staff of the Somerset Hospital, Green Point, Cape Town.

Appointment will be made subject to the provisions of Ordinance No. 18 of 1946, as amended, and the regulations framed thereunder.

Applications containing particulars of age, qualifications and experience should be furnished, so as to reach the Medical Superintendent of the Somerset Hospital not later than Friday, 8 January 1954.

(A1808)

Munisipaliteit van Oudtshoorn

KENNISGEWING Nr. 98 VAN 1953

AANSTELLING VAN DEELTYDSE MEDIESE GESONDHEIDS-BEAMPTTE

Aansoeke word hiermee gevra en sal deur die ondergetekende ingewag word tot om 12 middag op Maandag, 4 Januarie 1954 van Mediese Geneeshere vir die vakante betrekking van deeltydse Mediese Gesondheids-Beampte vir die Munisipaliteit van Oudtshoorn.

Die ooreenkoms in verband met die werk en terme van aanstelling kan gedurende kantoorure by die kantoor van die ondergetekende gesien word.

Die besoldiging in verband met die aanstelling is:

£130 per jaar vir die dienste van die deeltydse Mediese Gesondheids-Beampte, plus £144 per jaar vir werk gedoen op die Veneriese Siektes en Tering Klinieke.

Die aanstelling van deeltydse Mediese Gesondheids-Beampte is onderhewig aan die goedkeuring van die Minister van Gesondheid.

Stemwerwing van Raadslede sal 'n diskwalifikasie wees.

Munisipaliteitskantore
Oudtshoorn

F. C. Dods
Stadsclerk
2777-n11,14

Provinsiale Administrasie van die Kaap die Goeie Hoop

ORTOPEDIESE-TEHUIS LADY MICHAELIS PLUMSTEAD

VAKATURE: DEELTYDSE MEDIESE GENEESHEER

Aansoeke word ingewag van geregistreerde mediese geneeshere vir aanstelling in die pos van deeltydse Mediese Geneesheer by die bogenoemde inrigting met besoldiging teen £90 per jaar.

Die aanstelling sal vir 'n onbepaalde tydperk duur maar mag deur drie maande skriftelike kennisgewing beëindig word aan albei kante.

Aansoeke met besonderhede van ouderdom, kwalifikasies, ondervinding, ens. moet gerig word aan die Mediese Superintendent, Wynberg Ortopediese en Herstellingstehuse, Sentrale Kantoor, Loopstraat 58, Posbus 1487, Kaapstad en moet gepos word om hom nie later as 5 Januarie 1954 te bereik nie.

A560624

Assistantship Required

Experienced South African Jewish doctor requires assistantship with view to partnership in Southern Rhodesia. Qualified six years. Write to 'A. T. X.', P.O. Box 643, Cape Town.

Provinsiale Administrasie van die Kaap die Goeie Hoop

SOMERSET-HOSPITAAL

AANSTELLING VAN TWE ERE-NARKOTISEURS

Aansoeke van geregistreerde spesialiste en algemene geneeshere word ingewag vir aanstelling in twee poste van ere-Narkotiseurs by die Somerset-hospitaal, Groenpunt, Kaapstad.

Die diensvoorwaardes word voorgeskryf ingevolge Ordonnansie no. 18 van 1946 soos gewysig, en die regulasies wat daarkragtens opgestel is.

Aansoeke waarin ouderdom, ondervinding en kwalifikasies vermeld word moet die Mediese Superintendent, Somerset-hospitaal nie later as 8 Januarie 1954 bereik nie.

A1808

Provincial Administration of the Cape of Good Hope

HOSPITALS DEPARTMENT

VACANCIES FOR HONORARY MEDICAL OFFICERS

Applications are invited from registered medical practitioners for appointment to the under-mentioned posts at the Provincial Hospital, Port Elizabeth:

- (a) *Department of Surgery*
Senior Honorary Surgeons (3).
Assistant Honorary Surgeons (3).
Registrars to department of Surgery (3).
- (b) *Department of Medicine*
Senior Honorary Physicians (2).
Assistant Honorary Physicians (2).
Registrars to department of Medicine (2).
Registrar to department of Medicine (Psychiatry).
- (c) *Department of Obstetrics and Gynaecology*
Senior Honorary Obstetricians and Gynaecologists (2).
Registrars to department of Obstetrics and Gynaecology (2).
Clinical Assistants to department of Obstetrics and Gynaecology (2).
- (d) *Department of Orthopaedics*
Senior Honorary Orthopaedic Surgeon.
Assistant Honorary Orthopaedic Surgeon.
- (e) *Department of Otolaryngology*
Senior Honorary Otolaryngologist.
Assistant Honorary Otolaryngologist.
Registrar to the department of Otolaryngology.
- (f) *Department of Dermatology*
Senior Honorary Dermatologist.
Clinical Assistant to the department of Dermatology.
- (g) *Department of Ophthalmology*
Senior Honorary Ophthalmologist.
Assistant Honorary Ophthalmologist.
- (h) *Department of Anaesthetics*
Senior Honorary Anaesthetist.
Assistant Honorary Anaesthetist.
Clinical Assistant to department of Anaesthetics.
- (i) *Department of Urology*
Senior Honorary Urologist.
Assistant Honorary Urologist.
- (j) *Department of Radiology*
Senior Honorary Radiologist.
Assistant Honorary Radiologist.
- (k) *Department of Paediatrics*
Senior Honorary Paediatrician.
Clinical Assistant to department of Paediatrics.

The appointments, conditions of service and remuneration attached to the above-mentioned posts shall be subject to the provisions of the regulations promulgated under Provincial Notice No. 533 of 1953.

Applications must be made on the prescribed form which is obtainable from the undersigned to whom completed forms must be addressed to reach his office not later than 31 December 1953.

J. H. McLean
Provincial Hospital
Port Elizabeth
4 December 1953
Medical Superintendent
(10388)

For Sale

Zeiss Monocular Microscope with mechanical rotating stage, Rackwork substage and Triple nosepiece.

Objectives: 16 mm. 4 mm. 1.8 Oil Immersion and 1.8 mm. Dry.

Eye-pieces: 5 x and 10 x.

Condensor 1.4 N.A. with Iris Diaphragm. Complete in wooden case.

Price £50. Write to 'A. T. V.', P.O. Box 643, Cape Town.

City of Pietermaritzburg

VACANCY: ASSISTANT MEDICAL OFFICER OF HEALTH

VACANCY: CLINICAL MEDICAL OFFICER

Applications are invited from registered medical practitioners for the above posts in the Pietermaritzburg Public Health Department.

The salary grades attached to these posts are as follows:

Assistant Medical Officer of Health: £950 × 50—£1,150 per annum.

Assistant Medical Officer (Clinical): £950 × 50—£1,100 per annum.

Previous experience may be recognized in fixing the commencing notch of the salary grade.

In each case there is also payable:

(a) A cost-of-living allowance which at present is £289 16s. per annum if married (which rate is likely to increase from 1 February 1954) and statutory rate if single.

(b) A variable transport allowance which is fixed annually by the City Council and which at present is £177 per annum.

Experience in Infant Welfare Work and in the Treatment of Tuberculosis, Infectious Diseases and Venereal Diseases will be a recommendation.

In the case of the post of Assistant Medical Officer of Health the possession of a Diploma of Public Health is essential. Applicants should indicate whether they wish to be considered for only one or for both of the posts advertised.

The successful candidate will be required to serve a probationary period of 12 months and will also be required to furnish a satisfactory Medical Certificate on the prescribed form and to join the Municipal Superannuation Fund if eligible.

Applications on the form provided for the purpose, which together with a list of duties, may be obtained from the undersigned and accompanied by copies of not more than three testimonials, will be received by the Town Clerk until Wednesday, 6 January 1954.

Applicants should state the earliest date they could commence duty if appointed.

City Hall
Pietermaritzburg
3 December 1953

D. O'Mahony
Town Clerk

(4117)

Universiteit van Pretoria

VAKATURES: DEPARTEMENTE VAN FISILOGIE EN ANATOMIE

Aansoek om die volgende permanente betrekking in die departemente van Fisiologie en Anatomie word ingewag:

I. Departement Fisiologie

Professor in en Hoof van die departement.

Salarisskaal: £1,200 × 50—£1,400 × 50—£1,500.

Geneeshere sal voorkeur geniet. Dienste moet aan die begin van die tweede semester 1954 aanvaar word.

II. Departement Anatomie

Lektoraat: Salarisskaal £650 × 50—£900 × 50—£950.

Mediese kwalifikasies is nie noodwendig 'n vereiste nie. Dienste moet op 1 Februarie 1954 of so spoedig moontlik daarna aanvaar word.

Algemene Inligting

Die voorgeskrewe duurtetoelag, tans £100 per jaar vir ongetroude en £320 per jaar vir getroude persone is van toepassing. Dit mag oorweeg word om, indien die suksesvolle applikante dit versoek hulle toe te laat om 'n beperkte privaat praktyk te beoefen. Die aanvangsalaris sal vasgestel word volgens kwalifikasies en ervaring.

Aansoek vergesels van onlangse getuigskrifte en besonderhede omtrent kwalifikasies, ervaring, huwelikstaats en huidige salaris/inkomste plus toelaes, moet gerig word aan die Waarnemende Registrateur, Universiteit van Pretoria. Die sluitingsdatum vir aansoek om die betrekking van die professoraat is 15 Februarie, en dié van die lektoraat 4 Januarie 1954.

C. H. Stuart
Waarnemende Registrateur



Transvaal Provincial Administration

VACANCIES: TRANSVAAL PUBLIC HOSPITALS

Applications are invited from suitably qualified candidates for the undermentioned posts at Public Hospitals in the Transvaal.

Applications should be addressed to the Medical Superintendents of the undermentioned Hospitals concerned and should contain full particulars as to the age, professional and academic and language qualifications, experience and conjugal status of the applicant and should further indicate the earliest date upon which duties can be assumed. Copies, only, of recent testimonials to be attached.

Cost-of-living allowance payable at present to full-time employees:—

Salary	Cost-of-living allowance Married	Single
Over £350 per annum	£320 per annum	£100 per annum

Full-time employees receive in addition to their salaries and cost-of-living allowance, the following privileges:

Leave and rail concession.

Successful candidates will be required to submit satisfactory certificates as also to submit to a medical examination at the hospital concerned.

Application forms are obtainable from any Transvaal Provincial Hospital or the Provincial Secretary, Hospital Services Branch, P.O. Box 2060, Pretoria.

The closing date of applications for undermentioned posts will be 4 January 1954.

Hospital	Post	Emoluments	Remarks
Coronation Hospital Board and the University of the Witwatersrand	Assistant Radiologist (1)	£1200 × 50—1500	Registered medical Practitioner.
Tara Hospital Board and the University of the Witwatersrand	Assistant Neuro-psychiatrist (1)	£1200 × 50—1500	Registered medical practitioner. Must be suitably qualified through training and experience.
Edenvale, P.O. Raedene	Clinical Assistant (1)	£620, 780, 820, 860	Registered medical practitioner.
Pretoria	Clinical Assistant. (Gynaecology and Obstetrics) (1)	£620, 780, 820, 860	Registered medical practitioner. To assume duty on 1 July 1954. (43758)

Wanted

Afrikaans-speaking bilingual locum required for five months from 1 January 1954, in partnership practice of five in Barberton. Salary £80 p.m. and transport allowance. Reply: Secretary, De Kaap Chambers, Pilgrim Street, Barberton.

For Sale

Cambridge Rocker Microtome in good condition with freezing attachment. Will anyone interested in same write to, or see 'R. P.', 204 Medical Centre, Johannesburg.

Partnership Offered

Partnership in dispensing practice Eastern Cape. Half share available at £1,750 for goodwill, drugs, etc. Hospital: easy practice. At least £2,000 nett per partner. Write 'A. T. T.', P.O. Box 643, Cape Town.

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Address

Examinations in which interested

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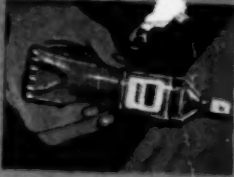
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